BEFORE THE POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

FRIENDS OF THE EARTH, PILCHUCK AUDUBON SOCIETY, PORT GARDNER INFORMATION LEAGUE, PUGET SOUND ALLIANCE, SEATTLE AUDUBON SOCIETY, SIERRA CLUB, WASHINGTON ENVIRONMENTAL COUNCIL and TULALIP TRIBES OF WASHINGTON, Appellants, v. STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, Respondent.	PCHB Nos. 87-63 and 87-64 FINAL FINDINGS OF FACT CONCLUSIONS OF LAW AND ORDER

These consolidated matters were heard concurrently with appeals brought under the Washington Shoreline Management Act. The instant cases concern appeals of a water quality certification, a temporary modification of water quality standards and a determination of consistency with coastal zone management requirements issued by the Washington Department of Ecology (Ecology).

The hearings were held before the Pollution Control Hearings Board, Wick Dufford (presiding), Lawrence J. Faulk and Judith A. Bendor. The combined hearings commenced in Everett, Washington, on January 15, 1988 and thereafter continued in Seattle, Washington and Lacey, Washington on January 19-22, 25-29, February 10-12, 17-19 and March 7-11, 1988. In all, 21 days were devoted to the hearings.

Appellants Friends of the Earth, et al., were represented by Todd D. True, Attorney at Law. The Tulalip Tribes of Washington were represented by Allen H. Sanders, Attorney at Law. Respondent Washington Department of Ecology was represented by Charles W. Lean and Peter R. Anderson, Assistant Attorney's General.

The Board conducted a site view on January 15, 1988. Now, having considered the testimony, exhibits and arguments of counsel, the Pollution Control Hearings Board makes these

FINDINGS OF FACT

I

The United States Navy proposes to create a homeport facility for an aircraft carrier battlegroup in Everett, Washington, on Port Gardner Bay in Puget Sound. The project would involve the construction of berthing and support facilities for up to 15 ships -- a mix of nuclear-powered and conventional craft, including a carrier, frigates, cruisers, destroyers and mine countermeasure ships.

II

The homeport is proposed to be built in and adjacent to the East Waterway, a portion of Everett's urban waterfront which for over a century has been the repository for outpourings of industrial wastes. The floor of the Waterway is now covered with a layer of thick soup, two to six feet deep, resembling black mayonnaise.

III

To make the homeport deep enough for the large ships involved, the Navy wishes to dredge the East Waterway. The effect would be to remove the black mayonnaise from the area dredged, as well as substantial amounts of underlying material. Overall the dredging work, combined with excavations necessary to reconfigure the site, would encompass 3,305,000 cubic yards of material.

The Navy proposes to dispose of this material at a site in deep water, a little more than one and two/thirds miles (approximately 9,000 feet) southwest of the Waterway. This site is referred to as the RADCAD (Revised Application Deep Confined Aquatic Disposal) site.

IV

The general concept of the disposal operation is to deposit the "contaminated" spoils within a discrete locale on the bottom of the bay, and then to cover them with enough "clean" material to form a cap which will effectively seal off the contamination and isolate it from the marine environment.

V

The RADCAD site ranges in depth from 310 to 430 feet below mean lower low water. The slope is gentle, averaging about one degree. The site extends approximately 6,000 feet downslope and is about 3,800 feet across at its widest points. The total coverage of disposal is about 380 acres of harbor floor.

VI

The dredging and disposal are planned to proceed in stages. First, about 500,000 cubic yards of "clean" material will be deposited at the downslope end of the RADCAD site. The purpose of this initial disposal operation is to create a berm which will help to contain the downslope surge of "contaminated" materials when the latter are deposited on site. The creation of the berm is also intended as a learning experience. It should provide the contractors an opportunity to work out any problems with the precise positioning of the barges over a predetermined dumping location.

After the berm is built, the plan is to deposit 97,000 cubic yards of "contaminated" material immediately upslope and then cover this with a cap consisting of 239,000 cubic yards of "clean" material. Creation of the berm and the initial contaminant capping operation, termed Phase I, are planned for the summer and fall of 1988.

Phase II, planned for the summer and fall of 1989, will complete the dredging and disposal effort. During this operation, 831,000

cubic yards of "contaminated" material will be deposited at the RADCAD site and and then covered with 1,638,000 cubic yards of "clean" capping material.

VII

Phase I is to serve as a smaller scale pass/fail test on which proceeding to the larger Phase II depends. Upon completion of Phase I, the Navy must demonstrate that certain physical criteria for mound-building and capping have been met. If these criteria are not met, the RADCAD site cannot be used for Phase II, and the Navy will have to find some other locale for almost 90% of the "contaminated" material and about three-fourths of all the material it intends to dredge from the East Waterway.

VIII

What is termed "contaminated" material is not limited to the black mayonnaise layer, but will include a considerable amount of underlying sediment from the East Waterway.

There is a clear visual discontinuity between the black mayonnaise and the fine-grained gray sediments which lie underneath. The dredging plan calls for approximately two feet of material below the visual discontinuity to be dredged along with the black layer, to be mixed with the black layer, and to be disposed of with it. Thus the "contaminated" material includes about two feet of native sediments underlying the black soup.

The "clean" material for the initial berm will come from the outer

harbor, and the "clean" capping material will come from the native materials generally lying deeper than two feet below the black layer.

IX

The dredging for the berm and "contaminated" materials will be by clam shell dredge and the disposal will be by bottom dump scow. The barge dump approach was selected in an attempt to facilitate mound building by minimizing disaggregation of the dredged materials. By contrast, the "clean" capping materials will be disposed of over the RADCAD site as a slurry through a drain pipe extending about 50 feet below the water surface. This will allow a controlled rate of release, so that the cap will gently rain down on the "contaminated" sediments already in place. The idea is to prevent the displacement of "contaminated" sediments which might occur if they were bombed by "clean" sediments in compact clumps.

X

To protect fisheries resources, dredging and disposal operations for each phase are not to begin until after June 15 of the year the phase is conducted. In Phase I, up to a month and half may be used for placement of the berm. Thereafter, disposal of contaminated sediments will occur for about three weeks. Construction of the Phase I cap will take about five weeks. Phase I operations should be completed by October 1, 1988. If allowed, disposal of contaminated material during Phase II will occur during a period of up to three

months, beginning after June 15. The final cap will be constructed during the following three month period. Phase II should be completed by mid-December.

XI

The described dredging and disposal project has taken shape over the last several years through various permit-issuing processes. These processes have produced three environmental impact statements - one by the Navy (June 1985), one by Ecology (September 1986) and a third by the United States Army Corps of Engineers (Corps) (November 1986) -- attempting to meet the requirements of the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). The final NEPA and SEPA documents total eight volumes, not including various drafts and unpublished appendices.

All of these environmental documents were before Ecology and utilized by it on March 2, 1987, when it issued the Navy a certification pursuant to section 401 of the Federal Clean Water Act (33 U.S.C. Sec. 1341). The certification, in effect, provided the State's determination of "reasonable assurance" that the Everett homeport project, as conditioned, will not violate applicable water quality standards.

Along with the water quality certification Ecology issued a temporary modification of water quality standards (Order No. DE 87-119) to the Navy, authorizing the use of dilution zones during the actual periods of dredging and disposal.

Also on March 2, 1987, Ecology formally advised of its concurrence in the Navy's determination that the Everett homeport dredging project is consistent with the State's plan adopted pursuant to the Federal Coastal Zone Management Act. (16 U.S.C. Sec. 1456).

XII

On March 31, 1987, the various appellant environmental organizations filed with the State Pollution Control Hearings Board an appeal of the water quality certification, the temporary water quality standards modification and the coastal consistency determination. Appellant Tulalip Tribes filed a parallel appeal on March 31, 1987. These appeals were given our numbers PCHB 87-63 and 87-64 and consolidated for hearing.

XIII

The Navy, by agreement with the State, also sought a permit under the State Shoreline Management Act from the City of Everett. On June 10, 1987, this application was approved by the City, and included a requirement that the Navy comply with Ecology's water quality certification. Thereafter, on July 8, 1987, Ecology approved the City's shorelines action. The shorelines approval was appealed to the State Shorelines Hearings Board by the environmental organizations on July 29, 1987, and by the Tulalip Tribes on August 4, 1987. These appeals were docketed as SHB Nos. 87-31 and 87-33 and consolidated for

hearing. Subsequently, a procedure was worked out with all parties by which the water quality and shorelines appeals were heard concurrently by the two Boards.

XIV

After the various approvals from the City of Everett and the State of Washington were received, the Corps issued a permit for the Navy homeport project pursuant to Section 404 of the Federal Clean Water Act (33 U.S.C. Sec. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Sec. 403). The Corps' permit set forth as an express condition that the Navy must comply with all provisions of the water quality certification issued by the State.

XV

The water quality certification under appeal contains 102 pages of conditions and attachments. Included are the pass/fail criteria which must be met before Phase II can be performed. Also included is a requirement that the Navy comply with conditions "related of water quality and aquatic life" and other "reasonable and appropriate conditions" in the shoreline permit.

Much of the water quality certification is devoted to monitoring requirements, calling for baseline studies, monitoring at each step of the disposal process and long-term monitoring. Pursuant to the certification a detailed monitoring plan was submitted for the Navy on November 9, 1987, and subsequently approved by Ecology.

XVI

The principal concerns of the appellants in the cases before the Pollution Control Hearings Board can be summarized as follows: 1) that the capping of "contaminated" sediments won't work to seal off the contaminants from the aquatic environment; 2) that, even if capping does work, the "clean" sediments used for the cap may themselves be sufficienty contaminated to cause environmental harm; and 3) that, if adverse effects are in fact caused by the project, the required monitoring program will not detect them.

XVII

The RADCAD site is unremarkable biologically, ranking on the low end of the scale of habitat value. No unique or unusual features set it apart from other deep water Puget Sound habitat.

XVIII

The deep water site was ultimately selected to avoid interference with the dungeness crab resource. Large numbers of, mostly female, dungeness crabs were discovered at a shallower site, nearby but upslope. An extensive surveying effort has demonstrated that the habitat preferred by these crabs throughout the year is in such relatively shallow water. Densities of dungeness crabs in the deep water RADCAD disposal area are low.

A small number of crabs will probably be crushed or smothered by the dredge disposal operation. However, because crabs are highly

mobile, some of those few occupying the RADCAD site when the bombardments occur should be able to move to safety. Overall we find that the physical placement of dredge spoils at the RADCAD site will probably not have a significant negative effect on the dungeness crab population of Port Gardner.

Moreover, we have no evidence that the physical placement of spoils at the deep water site will adversely affect any other macrofauna of economic importance, such as shrimp or fish.

XIX

Benthic invertebrates, primarily polychaete worms, inhabiting the natural silts at the RADCAD site, will be covered over by the disposal operations. But the effects of covering the sea floor at the site will be temporary and will not, we find, result in losses to the benthic community of serious environmental consequence. Rapid recolonization of the cap can reasonably be anticipated.

XX

The RADCAD site is a depositional area. Over time deltaic silts washed into the bay from the mouth of the Snohomish River naturally accumulate in the area. Average currents at the site are among the quietest in the Puget Sound, in the two to three centimeters per second range, too weak to move even fine sediments. Currents at the site rarely, if ever, reach erosive force. Thus, natural forces are

not likely to move materials comprising the capped mound. What has been built at the RADCAD site is likely to stay there. Further, in the long run natural deposition should perform additional capping.

XXI

The Navy's disposal plan is in some ways a pioneering effort. Precision mound building and cap placement on such a large amount of dredged material using multiple barge dumps at the depths involved, has not been previously attempted.

It was in recognition of this, that Ecology, in the water quality certification, made success of the Phase I disposal effort a prerequisite to proceeding to Phase II. As noted, the volume of "contaminated" materials planned for Phase I is only a little more than 10% of the total volume of such materials proposed for the project. Further, in general the Phase I materials are less severely contaminated than those involved in Phase II.

The effect, then, of giving a pass/fail role to Phase I is to reduce substantially the magnitude of risk involved in attempting something without an exact historical precedent. Phase I will provide the precedent.

XXII

The proposed confined aquatic disposal operation, as conditioned, involves the use of state of the art techniques, and we find that this operation will probably be successfully performed as planned.

Microwave locating methods will permit barge positioning for the dumping process which is accurate within a few feet. The movable submerged pipe used for cap application will similarly be positioned with a high degree of accuracy.

Once the materials are released they should descend to the bottom and spread and accumulate on the bottom essentially as forecast. While field experience with mound building and capping has involved differing conditions of volume and depth, these factors do not introduce variables beyond the bounds of credible prediction. The physical processes involved in the capping operation have been extensively studied and are well understood. The laws of physics will not be repealed for this project.

XXIII

Under the disposal plan most of the cap will initially be 7 to 9 feet deep. Consolidation of the cap over time will reduce this thickness to 5 to 7 feet.

The certification requires that 95 percent of the Phase I "contaminated" sediments greater than three centimeters thick be covered with a minimum of one meter (3.28 feet) of "clean" cap material. We find this requirement will be met, and probably exceeded over most of the cap.

XXIV

Much of the chemical contamination associated with the East

Waterway is bound to sediments and will remain so through the dredging and disposal process. This sediment-bound contamination can affect organisms through direct contact, ingestion or uptake through the food chain. Such pathways can, however, be blocked by an adequate barrier between "contaminated" sediments and the marine environment.

Absent penetration by burrowing organisms, a cap thickness of 30 centimeters (nearly a foot) would, under the quiescent conditions at the RADCAD site, be adequate to isolate chemicals in the contaminated sediments from the marine environment. No leaching of significant quantities of contamination up through such a layer is to be expected. At the RADCAD site the vast majority of the cap will exceed this thickness by five to seven times.

XXV

Appellants have argued that burrowing organisms may invade the cap, burrow through it and transport contaminated materials to the cap surface.

Given the cap thickness anticipated for the project, we believe there is probably sufficient vertical separation to insure against any significant contaminant releases from cap penetration by burrowing organisms.

Two burrowing organisms are present at the RADCAD site, a burrowing sea cucumber and a burrowing shrimp. The sea cucumber does not create deep burrows or move appreciable amounts of sediment and presents no threat to the integrity of the cap.

The burrowing shrimp is a little known species, but we were not convinced that the absence of specific data about it presents a significant cause for concern for the effectiveness of capping at the RADCAD site. Nothing from sampling and observations in Port Gardner Bay suggests that these shrimp are moving large quantities of sediment to the surface. If they do move large amounts of water through their burrows and the burrows are deep enough to penetrate the contaminated sediments, any releases of sediment-bound contaminants into the water column would still be expected to be minimal.

XXVI

In sum, we find that confined aquatic disposal at the RADCAD is likely to be effective in sealing off the contaminants under the cap from the aquatic environment.

Though, a cap thickness criterion does not apply to five percent of the Phase I "contaminated" material over three centimeters thick, even this five percent must be capped to some degree. We are not persuaded that the potentially thinner cap over this percentage of material at the margins threatens significant environmental harm.

XXVII

The introduction of chemicals to the natural environment by human activities is contamination. The term "contaminated" does not itself express the degree of environmental change introduced or its effects on biological resources.

"Contaminated" as used in connection with this project refers to the black mayonnaise and the two feet of sediments found below it which are to be confined beneath a cap of "clean" material to the extent it is technically possible to do so.

The decision to treat this material in this way is a matter of prudence based on an assessment of perceived risks. The decision does not rest upon -- and our record does not contain -- a demonstration that the mixture of dredged material being treated as "contaminated" would in fact cause acute or chronic toxic conditions to the aquatic biota if disposed of without a cap. There are indications in the record that such a mixture might be deemed suitable for use as capping material in disposal operations on the country's east coast.

The decision to confine the "contaminated" material at the RADCAD site can be seen as a response to the high level of environmental awareness and concern which surrounds the treatment of resources in the Puget Sound area. The understanding that "contaminated" is a relative term has, however, influenced our consideration of the evidence.

We are aware that certain of the "contaminated" materials will not be accounted for even if all the water quality certification pass/fail criteria for Phase I are successfully passed. The Phase I criteria do not apply to dumped material on the sea floor less that three centimeters thick. Moreover, some "contaminated" material will be

suspended in the water column during both dredging and dumping. This suspended material or mass loss will eventually find its way to the bottom in a diffuse and dilute distribution. We find that five percent is a reasonable figure to use in predicting mass loss.

On consideration of the record before us, we find that it was not proven that any significant adverse environmental effects are likely to occur because of the effects of "contaminated" material which may either escape being capped or whose ultimate resting position cannot be accounted for.

XXVIII

The impacts of chemicals bound to sediments are related to the quality of the aquatic environment but are not, strictly speaking, expressive of the quality of the water itself.

Capping will effectively isolate most of the chemical contaminants bound to the wet sediments, but certain solubles will be released into the water column during dredging and disposal. The weight of evidence is that contamination of the water column attending the project will not result in the violation of any of the traditional, measured criteria of water quality, such as dissolved oxygen, nor adversely affect the aquatic biota.

XXIX

The water quality standards established by Ecology for waters of the State of Washington contain no adopted standards explicitly

directed to contaminated sediments. There were no established numerical standards for the regulatory agency to apply when it issued the water quality certification and there are none today.

Therefore, the agency was obliged to evaluate the Navy's proposal in light of the more generalized concept of avoidance of environmental harm. The waters at the RADCAD site are Class A waters and the relevant catchall standard for them appears at WAC 173-201-045(2)(c)(vii):

> Toxic, radioactive, or deleterious material concentrations shall be below those of public health significance, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect any water use.

No case has been made that the Everett homeport project's dredging and disposal operations will cause public health problems or adversely affect any water use. These appeals have centered on the possibility of damage to aquatic biota. This has required looking beyond numerical measurements to expert opinion as to what biological impacts can be expected.

XXX

While the Navy's application was being processed, a group of Federal and State resource agencies, including Ecology, was engaged in an extensive effort to develop a dredged material management plan for the Puget Sound. The undertaking is called the Puget Sound Dredged

Disposal Analysis (PSDDA) and is still ongoing. The objectives are to identify unconfined open-water disposal sites for dredged material in the Sound and to create a set of dredged material evaluation procedures to use to decide whether specific dredging projects will be permitted to engage in unconfined open-water disposal.

PSSDA published materials, in draft form, in January of 1988, more or less contemporaneously with the onset of our hearings. Included was a description of disposal guidelines used historically, among them chemical sediment criteria developed in relation to site specific applications for disposal prior to the PSDDA program: the so-called Fourmile Rock and Port Gardner interim criteria. These sets of criteria reflect a non-degradation approach, in general aimed at limiting contamination to levels previously measured, either at the disposal site (Fourmile Rock) or at a remote site thought to represent background levels for the central Puget Sound basin (Port Gardner). The PSSDA effort itself has produced proposed chemical screening levels, which, if exceeded, would call for biological analysis.

There is, to date, no definitive scientific demonstration which relates the chemical levels of any of these interim criteria to any particular environmental harm.

XXXI

In the development of the dredging plan for the Everett Homeport, scientists conducted studies over several years to characterize the

East Waterway sediments and soils for chemical contamination and to provide some biological testing.

These studies produced evidence of two distinct layers, the top containing sigificantly elevated levels of chemical contaminants and the underlying sediment being relatively clean. The distinction in chemistry was found to correspond in general with the clear visual discontinuity between the black mayonnaise and the grey native materials. Extensive core sampling established visually that the two layer formation could be readily distinguished throughout the Waterway.

This dividing line between "contaminated" and "clean" formed the basis for the design which ultimately called for the dredging of the top layer to include two feet below the visual discontinuity, as a margin of safety.

XXXII

Chemical analysis of the "clean" native sediments showed that in some samples, some of the Fourmile Rock and Port Gardner interim chemical levels were exceeded. In addition most of the native sediment samples exceeded the proposed PSDDA screening levels for biological analysis, for one or more of the chemicals analyzed.

The biological testing actually performed involved an acute toxicity amphipod bioassay and bioaccumulation testing of clams and mussels. At the time, these tests represented the generally accepted methods and practices of the scientific community. The sediments

tested did not prove to be acutely toxic to the amphipods. Uptake of aromatic hydrocarbons in both clams and mussels was detected, but this data was not related to any measure of sublethal or chronic effects.

XXXIII

Appellants assert that the native sediments were not tested for enough chemicals, that exceedances of the Fourmile Rock, Port Gardner and PSDDA draft criteria are cause for concern and that the biological testing should have involved more tests on more species. All of these asserted shortcomings in the characterization of the level of contamination in the native sediments, they argue, lead to the conclusion that the "clean" sediments have not been shown to be clean enough to be used for capping. They ask for a rejection of the dredging project pending further studies to assess more intensively the risk of adverse biological impacts from exposure to the "clean" sediments.

XXXIV

We are not persuaded that more work is needed to analyze the likely effects of the materials that will be used for capping. Expert testimony conflicted as to whether the "clean" sediments have been adquately characterized in regard to their potential to harm the biota. On the basis of all the evidence we find the view that significant harm is unlikely to be the more credible.

In so finding, we note that the samples of native sediments analyzed were composites, so that materials from the top of the core sections analyzed were mixed with materials from the bottom. We think it probable that the most contaminated portions of these cores were at the top nearest to the black mayonnaise. We are persuaded that overdredging the visual discontinuity by two feet will capture most of the contamination in the native sediments.

XXXV

Overall, then, we believe that the project will probably pass the criteria set by Ecology as a test after Phase I, and we find that if such criteria are met, there is reasonable assurance that the project is not likely to cause acute or chronic toxic effects to the aquatic biota. The "clean" capping material will likely be clean enough.

XXXVI

An extensive monitoring effort is required by the water quality certification to measure the physical conformity of the Phase I dredging and disposal with project plans.

This aspect of monitoring will collect data to evaluate the accuracy of dredging and the accuracy of disposal, for water column effects and mass loss of materials.

An array of highly sophisticated equipment and techniques will be brought to bear on these tasks, including micro-wave range

positioning, accoustic bathymetry, sediment profiling cameras, extensive core sampling, side scan sonar, current tracking drogues, submersible profiling transmissometers, and sediment traps.

The physical monitoring plan will, we find, enable observers to determine the success or failure of the Phase I capping operation with the precision necessary to determine whether Ecology's pass/fail criteria have been met.

XXXVII

The monitoring plan also calls for a range of sampling and testing for biological and chemical information at the RADCAD site, both before and after the capping operation. Ten years of long-term monitoring are contemplated. At the end of that time the Navy will have to verify that a minimum of one meter of "clean" material is present as a cap over the contaminated material - "clean" being defined as suitable for open water unconfined disposal as determined by the state of knowledge then.

The bioeffects program is much larger than has been required of other dredge disposal projects. It will develop baseline and post-hoc data bearing on such matters as fish and shellfish composition and abundance, histopathology, the benthic community, bioaccumulation and bioturbation. Though considerable expertise has gone into the program's design, there is expert dispute over what the data will mean.

We expect this dispute to continue up to and during the dredging and for the 10 years of monitoring which follow it. However, we are convinced that much useful information will be derived, of significant value to the ongoing study of dredged materials disposal in the Puget Sound and elsewhere.

If acute or chronic toxic effects from the RADCAD disposal project are detected, Ecology and others will be faced with an enforcement problem. Nevertheless, looking forward at this preconstruction phase, we have reasonable assurance that such effects will not occur. The chemical and biological monitoring plans for the project in no way undermine this assurance.

XXXVIII

A companion opinion, has affirmed permits for the Navy's Everett homeport dredging and disposal project as consistent with the State's Shoreline Management Act. We incorporate here the findings from that affirmance in connection with our Conclusion, expressed below, concerning Ecology's coastal consistency determination.

XXXIX

We have reviewed the environmental documents which were before Ecology in reaching the decisions under review here. These documents reveal a deliberated effort to anticipate environmental consequences in a world which wants of perfect knowledge.

Overall, we find that the environmental documents relied upon provide adequate disclosure of the likely negative impacts, both of using the RADCAD site and of using non-speculative alternatives, to allow for informed decision making. We find that these documents meet the rule of reason.

XL

Any Conclusion of Law which is deemed a Finding of Fact is hereby adopted as such.

From these Findings the Board comes to the following

CONCLUSIONS OF LAW

I

The Pollution Control Hearings Board has jurisdiction over these parties and these matters. Chapter 90.48 RCW, Chapter 43.21B RCW.

II

U.S. Environmental Protection Agency (EPA) regulations governing issuance of certifications of compliance with water quality standards provide, in 40 CFR 121.2:

> (a) A certification made by a certifying agency shall include the following: . . . .
>
> (3) A statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards;
>
> (4) A statement of any conditions which the certifying agency deems necessary or desirable with respect to the discharge of the activity; . . . . [Emphasis added].

We conclude that when a state certifies compliance, pursuant to Section 401 of the Federal Clean Water Act, with various provisions of the Act which also incorporate state water quality law and water quality standards, the state is actually certifying that it has "reasonable assurance that there will be compliance with the applicable provisions" of the Act. 33 U.S.C.A. 1341(a)(3).

III

Ecology is the appropriate agency to issue water quality certifications under Section 401 of the Clean Water Act. RCW 90.48.260; WAC 173-225-010.

IV

Appellants challenging Ecology's isssuance of a water quality certification bear the burden of proof. Thus, to overturn the certification, appellants must establish by a preponderance of the evidence that Ecology did not have "reasonable assurance" that the applicable provisions would be complied with. The applicable provisions include Sections 301, 302, 303, 306 and 307 of the Clean Water Act, which deal with both effluent standards for discrete discharges and state-created water quality standards for receiving waters. The state certification process and these appeals have focused on compliance with the state water quality standards.

V

This appeal is governed by the water quality standards in effect

on March 2, 1987 when the water quality certification was issued. Those standards were promulgated in WSR 82-12-078, and it is to that version of the regulations that we cite in this opinion.

VI

The "reasonable assurance" required in these cases relates primarily to whether "toxic, radioactive or deleterious material concentrations" are likely to go beyond those which "may cause acute or chronic toxic conditions to the aquatic biota." WAC 173-201-045.

We disagree with appellants that the word "may" as used in the regulations requires only the showing of a "genuine and non-speculative risk". We conclude that the "reasonable assurance" requirement is met if we find by a preponderance of evidence that acute or toxic conditions are not, in fact, likely to occur.

VII

The water quality standards apply to the surface waters of the state. WAC 173-201-010. The standards are oriented toward the quality of the ambient water column. We are reluctant to conclude, however, that they do not cover the in-water disposal of sediment-bound contaminants. Such a conclusion is not necessary in this case.

Under the facts, we hold that there is reasonable assurance that no toxicity is likely to result from the dredging, dredged materials

disposal, and capping proposed by the Navy. (See Finding of Fact XXXV). Appellants have not established the contrary by a preponderance of the evidence.

VIII

In assessing whether Ecology had reasonable assurance that the water quality standards would not be violated, the generally accepted standards and methodologies applied to similar proposals across the country are clearly relevant. Informal criteria, or draft standards such as those being circulated by the PSDDA, are relevant only insofar as they reflect the generally accepted practices of the scientific community.

Likewise, the capabilities of current analytical methods are relevant. WAC 173-201-035(9), part of the water quality standards, reads:

> (9) Due consideration will be given to the precision and accuracy of the sampling and analytical methods used as well as existing conditions at the time, in the application of the criteria.

Fears that we do not know enough are part of the normal condition of mankind. By themselves, they are not sufficient to overcome Ecology's decisions in this case.

IX

The state's "anti-degradation" policy is expressed in RCW 90.54.020(3) and WAC 173-201-035(8). In general, the policy is simply

to prevent a decline in existing water quality and to insure the application of "all known available and reasonable methods" to the treatment of discharges.

We conclude that use of state of the art methods in the disposal and capping project satisfies the "all known available and reasonable methods" formula, and that meeting the "reasonable assurance" standard in regard to water quality standards satisfies the "anti-degradation" policy as a matter of law.

X

Appellants appear to argue that the legal purpose of the monitoring program is to guarantee that no harm will ever result from this proposal. Again we disagree. The monitoring program is a valid condition of the water quality certification imposed by Ecology to provide data on what is occurring in the project area. The "reasonable assurance" determination is, however, necessarily predictive in character, looking ahead to events which have not happened. The chemical and biological monitoring are addressed to a separate enforcement phase, distinct from prior certification approval. Even if the monitoring program did not require the Navy to do everything it might do to police itself after the fact, any shortcomings in self-surveillance requirements would not be grounds for overturning an otherwise valid certification as to the basic project itself.

The monitoring program required by Ecology for this proposal far exceeds that applied to any other dredged materials disposal project anywhere. In several instances Ecology has sought to expand the capabilities of existing analytical techniques by requiring investigations which truly probe the edges of current scientific knowledge.

We find no legal infirmity in the monitoring program Ecology has imposed and which the Navy has not challenged.

XI

Ecology issued a temporary modification of the water quality standards, modifying water quality criteria within specified dilution zones. Such action is authorized by WAC 173-201-035(8)(e) which authorizes such action "when necessary to accommodate essential activities, respond to emergencies, or to otherwise protect the public interest".

Our review of environmental impacts, and particularly of water quality impacts, is a limited part of of the overall siting decision for the homeport at Everett. The decision involves considerations of national policy beyond our review. For the purposes of the issuance of a temporary water quality modification, we conclude that such policy determinations constitute this project on "essential activity," as that term is used in the regulation. Accordingly, we hold that issuance of a temporary modification was proper in relation to this project.

It was not demonstrated that the Navy and its contractors will be unable to perform the project without violating the limits of the temporary modification. Therefore, we decide that the issuance of the modification was lawful.

XII

Appellants argue that the Navy proposal is unlawful because the Navy has not obtained an oil discharge permit pursuant to RCW 90.48.343. This argument, in effect, asks us to issue a declaratory ruling on the applicability of a legal provision which is distinct from the water quality certification approval process. We decline to do so in these contested cases directed to review of specific decisions made by Ecology.

XIII

The procedural provisions of SEPA require full disclosure of environmental consequences. Norway Hill v. King County Council, 87 Wn.2d 267, 552 P.2d 674 (1976). Governmental agencies are required to evaluate environmental factors and for this reason certain actions require an environmental impact statement (EIS). Eastlake Com. Coun. v. Roanoke Assoc. 82 Wn.2d 475, 513 P.2d 36 (1973). When the adequacy of an EIS is at issue, the question to be answered is whether the environmental effects of the proposed action and reasonable alternatives are sufficiently disclosed and discussed, and that they are substantiated by supportive opinion and data. Leschi v. Highway Comm'n, 84 Wn.2d 271, 525 P.2d 774 (1974).

> The mandate of SEPA does not require that every remote and speculative consequence of an action be included in the EIS. The adequacy of an EIS must be judged by application of the rule of reason.

Cheney v. Mountlake Terrace, 87 Wn.2d 338, 552 P.2d 184 (1976). Appellants contend that there is inadequate environmental information to assess impacts of the proposed action. We do not agree. We have found as a fact that the environmental documents used by Ecology in connection with its SEPA responsibilities adequately disclosed negative impacts and, therefore, we conclude the SEPA was complied with as a matter of law.

The disclosures made in the SEPA process may substantively support decisions to condition or disapprove a project. However, such disclosures, absent an extreme case evidencing abuse of discretion, do not compel any particular substantive result. The disclosures made here, including those attending the alternative of upland disposal, are far from presenting such an extreme case.

XIV

The shoreline conditional use permit covering the Navy's proposal has been issued, and now has been affirmed by the Shorelines Hearings Board. Appellants' argument that the coastal zone consistency determination should not have preceded the permit is therefore moot.

Moreover, we conclude that the affirmance of the shoreline permit establishes the consistency of the action proposed within the Coastal Zone Management Act, as a matter of law.

We are impressed by the thoroughness and high quality of the presentations of all parties to this dispute. It is a complicated matter and a highly technical one. It involves a profusion of detail in which it is difficult to avoid getting lost.

However, when all is said, we perceive the central question to be whether capping can be done effectively over the amount of material to be covered at the proposed depths. We were convinced that existing technology is equal to the task.

We appreciate the sincerity and intelligence of those who feel the attempt here is too risky. As a matter of judgment, we simply disagree. We believe enough is now known for a fair evaluation of the risks and are persuaded that the chances of significant environmental harm are not, in fact, very large.

Indeed, all things considered, we view the Navy Homeport project, as conditioned by the Washington Department of Ecology, as an unusual and encouraging example of federal-state cooperation. Making Phase I function as a pass/fail test of capping effectiveness is a conservative approach, as well as an innovative one. Ecology has been aggressive in attempting to protect the environment of this state. The Navy has been willing to go to considerable lengths to insure that its national security aims are not pursued at the expense of that environment. This is not a government sponsored program of scientific

research. It is a carefully conditional construction project. We think it is now time for the project to move forward.

XVI

Any Finding of Fact which should be deemed a Conclusion of Law is hereby adopted as such.

From these Conclusions, the Board enters this

ORDER

The water quality certification, temporary modification of water quality standards and coastal consistency determination issued by the Washington State Department of Ecology in connection with the United States Navy's Everett homeport project are affirmed.

DONE this 17th day of May, 1988.

POLLUTION CONTROL HEARINGS BOARD

WICK DUFFORD, Presiding

LAWRENCE J. FAULK, Member

(See Dissenting Opinion)
JUDITH A. BENDOR, Member

Bendor, Dissenting Opinion:

I respectfully dissent from my two colleagues' opinion. More extensive findings describing the projects are set forth in the companion Shoreline Hearings Board Opinion's Findings and Attachments, SHB Nos. 87-31 and 87-33 (Bendor/Eldridge/McLerran), at Appendix A hereto, and are incorporated by reference in this PCHB opinion.

I

The proposed RADCAD in-water disposal site is within Port Gardner Bay, at the gateway to the Snohomish River and Estuary, where salt and fresh water meet, an area of heightened biological production. The River, which contributes 20% of the freshwater to Puget Sound, hosts major anadramous fish runs of salmon and sea-run trout, including steelhead. Adjacent to RADCAD, within 1,000 feet to the northeast, east and south, are high concentrations of Dungeness Crab, including the highest concentration of egg-bearing (gravid) female crabs observed in Puget Sound. The RADCAD site has an array of other fish, including bottom fish, and is believed to be a nursery area for Pacific hake. Washingtonians, including the Tulalip Tribes, commercially fish the area. Recreational fishing also abounds. The waters of the RADCAD disposal area are classified as "Class A" marine waters ("Excellent") under the state water quality standards. WAC 173-201-085(20).

II

The federal Clean Water Act ("CWA") requires the United States Navy to obtain a "404" Army Corps of Engineers ("Corps") permit before dredged sediments can be disposed into navigable waters. 33 U.S.C. Section 1344. This law further requires that applicant Navy obtain a water quality certificate ("WQC") from the State which confirms that any such discharge of sediments complies, inter alia, with state water quality standards and will not adversly affect water quality. 33 U.S.C. Section 1341, referencing Section 1313.

This certification process is central to the system of federal-state cooperation to prevent and control water pollution in our nation's navigable waters:

> The purpose of the certification mechanism provided in this law [the Federal CWA] is to assure that Federal licensing or permitting agencies cannot override State water quality requirements. Senate Report 92-414 on P.L. 92-500, at 69, in Legislative History of the Water Pollution Control Act Amendments of 1972, Vol 2, at 1487.

The Corps has issued the 404 permit expressly requiring that the Navy comply with all provisions of the WQC.

III

The state water quality standards provide the foundation for the Pollution Control Hearings Board's review of these appeals.[1] It is the State's legislative enacted policy:

> to maintain the highest possible standards to insure the purity of all waters of the state

> consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington. Consistent with this policy, the state of Washington will exercise its powers, as fully and as effectively as possible, to retain and secure high quality for all waters of the state. RCW 90.48.010; emphasis added.

The goal of the state water quality standards is to provide for waters sufficiently free of pollution so that enumerated general and specific uses can occur. Pollution is defined as:

> such contamination, or other alteration of the physical, chemical or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely

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[1]A final WQC, however, is only one of the steps necessary for the Homeport disposal project to proceed. An overarching requirement is the obtaining of a State shoreline permit. The National Defense Authorization Act for Fiscal Year 1987, P.L. 99-661 (1986), recognized the importance of the state shoreline permit process.

> to create a nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life. RCW 90.48.020; emphasis added.

IV

The state's anti-degration regulations require that:

> (a) Existing beneficial uses shall be maintained and protected and no further degradation which would interfere with or become injurious to existing beneficial uses will be allowed.
>
> [. . .]
>
> (c) Whenever waters are of a higher quality than the criteria assigned for said waters, the existing water quality shall be protected and waste and other materials and substances shall not be allowed to enter such waters which will reduce the existing quality thereof, except, in those instances where:
>
> > (i) It is clear that overriding considerations of the public interest will be served, and
> >
> > (ii) All wastes and other materials and substances proposed for discharge into the said waters shall be provided with all known, available, and reasonable methods of treatment before discharge.
>
> [. . .]

> (f) In no case, will any degradation of water quality be allowed if this degradation interferes with or becomes injurious to existing water uses and causes long-term and irreparable harm to the environment. WAC 173-201-035(5).

The regulations specifically state that:

> (vii) Toxic, radioactive, or deleterious material concentrations shall be below those of public health significance, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect any water use. WAC 173-201-045(2)(c)(vii).

V

It is State legislative policy to work jointly and cooperatively with the federal government:

> to extinguish the sources of water quality degradation, while at the same time preserving and vigrously exercising state powers to insure that present and future standards of water quality within the state shall be determined by the citizenry, through and by the efforts of state government, of the state of Washington. RCW 90.48.010.

This cooperative theme is also explicit in the federal CWA, which allows State water quality standards to be more stringent than Federal standards. Morover, states' rights and jurisdiction with respect to navigable waters of the states are not impaired or in any manner affected by the federal act (unless expressly provided otherwise in the Act). 33 U.S.C. Section 1370(2).

VI

In determining what deleterious concentrations of toxic or other materials are, the State regulations require the consideration of the U.S. Environmental Protection Agency's ("EPA") Water Quality Criteria, "and/or other relevant information, if justified." WAC 173-201-045(12); emphasis added.

VII

The State Clean Water Act requires the use of all known available and reasonable methods to prevent toxic or deleterious materials concentrations that may degrade higher quality waters. WAC 173-201-035(8)(c)(vii). See also, RCW 90.48.010. The potential acute or chronic long-term toxicity of sediments disposed in water is well recognized. I, therefore, join my PCHB colleagues in concluding that state water quality standards (as existing on March 2, 1987) are not limited to consideration of water column concentration effects, but are directed to the overall water quality, over and above dissolved chemical levels.

VIII

The federal water quality certification regulations require (40 CFR Section 121.2) that the certifying agency (in this instance the Department of Ecology ("DOE")) state that it has either examined the application submitted and bases its evaluation on that information, or, it has examined other information sufficient to allow it, the

agency, to reasonably assure that the activity

> will be conducted in a manner which will not violate applicable water quality standards[.] 40 CFR Section 121.2(a)(3).

(The DOE chose the second route and examined other information.) The regulations also require that the certifying agency state any conditions which it deems necessary or desirable with respect to the dredge disposal. 40 CFR Section 121.2(a)(4). DOE issued the WQC with conditions on March 2, 1987.

IX

The Pollution Control Hearings Board decides appeals from DOE orders and decisions, such as from this WQC issuance. See, RCW 43.21B.010. This appeal process is an integral part of the State of Washington water pollution laws. The Board held a hearing and considered evidence de novo.

In these PCHB appeals, the Board has to determine whether the State water quality standards will be complied with. Appellants have the burden of proof. They have to establish, by a preponderance of the evidence, one of the following:

> 1. All known available and reasonable methods to control pollution have not been employed. RCW 90.48.010;

2. That contamination, or other alteration of the waters' properties will or is likely to render the waters harmful, detrimental, or injurious to public welfare, commercial, recreational, or other legitimate beneficial uses, or to fish or other aquatic life. RCW 90.48.020;

3. Acute or chronic toxic conditions for aquatic biota are likely to result. WAC 173-201-045(2)(c)(vii); or

4. Degradation of existing water quality will occur which will interfere with existing water uses and cause long-term irreparable harm to the environment. WAC 173-201-035(8).

X

The WQC as issued consists of primarily three parts:

1. Construction requirements;

2. Pass/Fail criteria for Phase I (only); and

3. Monitoring requirements.

The construction requirements, pass/fail criteria and monitoring and their deficiences are detailed in the SHB Opinion, at Appendix A.

In brief, the Navy plans to dispose of over 3,300,000 yd^3 of sediments including at least 928,000 yd^3 of sediment already identified as contaminated, into 310 to 430 feet of water at the gateway to the Snohomish River, adjacent to high concentrations of Dungeness Crabs. The volumnes are massive, the toxicity apparent. The disposal methodology is experimental; there has been no field verification of the predicted dumping, nor any real-world field experience in hydraulically capping contaminated sediments.

XI

From all the evidence, (including Appendix A), I conclude that appellants have proven that all known available reasonable methods to control pollution have not been employed. RCW 90.48.010. In particular, there are such methods to further condition the disposal operation which will provide true in-field safegaurds. (See Parag. XII, below.)

Appellants have also proven that contamination or other alteration of the area is likely to render the waters harmful to fish and aquatic life, and to render the waters detrimental to the public's welfare, and to commercial and recreational use to enjoy and to harvest marine life in Puget Sound, thereby violating RCW 90.48.020. Such harm is likely to result from toxic sediments being inadequately isolated from the marine environment, from inaccurate placement of sediments so that they are likely to injure marine life nearby, and from high mass losses off-site of clean sediments that are likely to impact the Dungeness Crabs by causing mortality, loss of reproductivity, other long-term chronic toxic effects and detrimentally altering their habitat, thereby violating RCW 90.48.020 and WAC 173-201-045(2)(c)(vii). The disposal project will also degrade the existing area so as to interfere with existing beneficial uses, in violation of RCW 90.48.020 and WAC 173-201-035.

However, if the Navy were to conform the project to the following conditions, and to be bound by their terms, appellants will not have sustained their burden of proof, and the project can timely proceed:

I. All sediment used in the Berm and the Cap shall be proven to be Clean prior to disposal. Clean is defined as:

A. Berm and Phase I

1. For every 48,000 yd^3 ("dredge unit") composited sample of sediment from 8 core samples, sediment in this dredge unit (or sub-unit therein at permittee's option) shall be Clean if the concentration of every chemical of concern and of each group of chemicals is less than or equal to 125% of SL 1 levels (Appendix A at Attachment 4).

2. For any dredge unit (or a sub-unit therein at permittee's option), if any chemical of concern or any group of chemicals' concentration exceeds 125% of SL 1 but is less than 100% of ML 2, sediment in that unit (or sub-unit) shall be Clean only if the unit passes biological testing (i.e. sediment toxicity and bioaccumulation) as delineated for unconfined open-water disposal in PSDDA (January 1988)(Exh. A-16M).

3. For any dredge unit or sub-unit, sediments are Contaminated and cannot be disposed unconfined if any chemical or any group of chemicals' concentration equals or exceeds 100% of ML 2.

B. Phase II

For every 24,000 yd^3 ("Phase II dredge unit") composited sample of sediment from 4 core samples, sediment in this dredge unit (or sub-unit therein at permittee's option), shall be Clean if the concentration of every chemical of concern and of each group of chemicals is less than or equal to 125% of SL 1 levels. . . . (Then the same text as for the Berm and Phase I, I.A. above.)

II. Placement of Dredged Sediment:

A. Berm

1. Up to 500,000 yd^3 of material can be disposed of at the RADCAD site during this stage.
2. The first five barge dumps do not have to conform to conditions Nos. II. A. 3 and 4, below.
3. 90% of the material shall be found within the berm boundaries as shown on Attachment 3 to Appendix A herein. (All location site references in these conditions are to this document.)

4. Significant thickness of Berm material, i.e. greater than 6 inches (approximately 15 centimeters), shall not be located 500 feet or more outside these Berm boundaries.

5. A discrete berm shall be formed.

B. Phase I

1. Contaminated Material

a. Up to 100,000 yd^3 of contaminated material can be disposed of at the RADCAD site during this stage.

b. 95% by volume of the contaminated material dredged shall be found within the first year boundary for contaminated material.

c. Contaminated material greater than 3 cm. in thickness (approximately 1.2 inches) shall not to be located 250 feet or more outside the first year boundary for contaminated material, or outside the first year construction boundary.

d. All contaminated material greater than 3 cm. in thickness shall be covered with a 1 meter consolidated cap.

2. Cap Material

a. 90% by volume of the cap material shall be found within the first year construction boundary.

b. Significant thickness of cap material, i.e. greater than 6 inches, shall not be located 500 feet or more outside the first year construction boundary or at less than the 350 feet water depth contour.

C. Phase II

1. Contaminated Material

a. 95% by volume of the contaminated material dredged shall be found within the second year boundary for contaminated material.

b. Contaminated material greater than 3 cm. in thickness shall not be located 250 feet outside the second year contamination boundary or outside the second year construction boundary.

c. All contaminated material greater than 3 cm. in thickness shall be covered with a 1 meter consolidated cap.

2. Cap Material

a. 90% by volume of the cap material shall be located within the second year construction boundary.

b. Significant thickness of cap material, i.e. greater than 6 inches shall not be located 500 feet or more outside the second year construction boundary or at less than the 310 foot water depth contour.

III. General Conditions:

A. Permittee has the burden to prove that all conditions have been passed.

B. Permittee can proceed to Phase I and Phase II only upon the Department of Ecology's determination and written notification that the preceding stage's conditions have been passed.

C. Upon the Navy's written notification that it has completed Phase II disposal and monitoring, the Department shall review Phase II for compliance and shall order any such measures necessary for full compliance with this permit. Final compliance with this permit shall be upon the Department's determination and written notification.

D. The Department shall conduct its reviews and provide its notifications in a timely reasonable manner. All previous permit conditions, either express or implied, imposing time restrictions on the Department are stricken (e.g., berm review).

E. These conditions are in addition to those in the shoreline permit as previously issued, and supercede them where inconsistent.

F. In performing its' responsibilities under this permit, the

Department may, at its discretion, consult with other agencies at the local, State and Federal levels.

G. This shoreline permit does not prevent the Department from taking other enforcement action not inconsistent with this permit.

These conditions are substantially based on the Navy's own data, and are essential to ensuring that this experimental disposal will be in compliance with the law.

DONE this 17th day of May, 1988.

JUDITH A. BENDOR, Member

BEFORE THE SHORELINES HEARINGS BOARD
STATE OF WASHINGTON

FRIENDS OF THE EARTH, PILCHUCK AUDUBON SOCIETY, PORT GARDNER INFORMATION LEAGUE, PUGET SOUND ALLIANCE, SEATTLE AUDUBON SOCIETY, SIERRA CLUB, WASHINGTON ENVIRONMENTAL COUNCIL and TULALIP TRIBES OF WASHINGTON, Appellants, v. UNITED STATES NAVY, CITY OF EVERETT, and STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, Respondent.	SHB Nos. 87-31 and 87-33 FINAL FINDINGS OF FACT AND CONCLUSIONS OF LAW

These consolidated Shorelines Hearings Board ("SHB"); appeals (Nos. 87-31 and 87-33) were heard concurrently with consolidated appeals to the Pollution Control Hearings Board (Nos. 87-63 and 87-64). The SHB appeals contest select aspects of the shoreline substantial development conditional use permit issued by the City of Everett to the United States Navy (subsequently approved by the Washington State Department of Ecology ("DOE")), for a proposed

APPENDIX A

5 F No 9928—OS—8-67

Homeport in Everett, Washington. The appeals challenge, in particular, the placement of dredged sediments, from Everett's East Waterway, into the waters of Port Gardner Bay, Puget Sound, Washington.

The combined hearings began in Everett, Washington on January 15, 1988 and continued on January 19-22, 25-29, February 10-12, 17-19 and March 7-11, 1988 in Seattle, and Lacey, Washington. Shorelines Hearings Board Members present were: Wick Dufford (Presiding), Lawrence J. Faulk, Judith A. Bendor, Les Eldridge, Nancy Burnett, and Dennis J. McLerran.

Appellants Friends of the Earth, et al., were represented by Attorney Todd D. True. Appellant Tulalip Tribes of Washington was represented by Attorney Allen H. Sanders. Respondent Washington Department of Ecology was represented by Assistant Attorneys General Charles W. Lean and Peter R. Anderson. The United States Navy was represented by Commander Thomas N. Ledvina, JAGC, and Alan P. Shapiro, Office of Counsel, Naval Facilities Engineering Command. The City of Everett was represented by Assistant City Attorney Walter Sellers.

The Board conducted a site view on January 15, 1988. Having considered the briefs, testimony, exhibits, and counsels' arguments, the Shorelines Hearings Board makes these

FINDINGS OF FACT

I

Background

The United States Navy proposes to build a Homeport facility for

an aircraft carrier battlegroup in Everett, Washington, in Port Gardner Bay, Puget Sound. The project would involve the construction of berthing and shore facilities for up to 13 ships: an aircraft carrier, frigates, cruisers, destroyers, mine countermeasure ships, both nuclear-powered and conventional craft.

The Homeport is to be built in and adjacent to the Everett East Waterway, which is part of the City's harbor, an urbanized waterfront. Industrial, municipal, and raw material wastes containing a vast array of chemicals have been deposited in the harbor over the past century through both point and non-point discharges. This has led to a creation of an odorous, sediment layer in the harbor that has been described as looking like "black mayonnaise".

To accommodate the large ships, the Navy plans to dredge 3,305,000 cubic yards ("yd^3") of bottom sediment and associated debris from the Waterway, and dispose of it at a 380-acre site in Port Gardner Bay, in water 310 to 430 feet deep (below mean lower low water), approximately 9,000 feet southwest of the East Waterway.[1] See Attachment 1, from Exh. A-3A, for locations.) This disposal site is known as RADCAD (Revised Application Deep Confined Aquatic Disposal).

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[1] Any debris longer than 10 feet, approximately 50,000 yd^3, would be disposed at an as yet unidentified upland site. Debris less than 10 feet long would be disposed with the sediments in water.

The East Waterway is within an environment designated "urban" by the Everett Shoreline Master Program ("SMP"). The RADCAD site is within a "shoreline of statewide significance" under the Shoreline Management Act, ("SMA") and is inside Everett's city limits. The City treated the Navy's application for sediment water disposal as an "unlisted" use in the SMP and required a conditional use permit; DOE concurred in this approach.

II

Marine Life

The RADCAD disposal site is near the mouth of the Snohomish River, where the fresh water of the River and the saltwater of the Sound daily meet. This creates an area of heightened biological productivity, particularly for feeding anadromous (migrating) fish, including salmon. The Snohomish River itself contributes over 20% of the fresh water flow to Puget Sound. Extensive commercial fishing, Indian tribal fishing, and recreational fishing, occurs throughout Port Gardner Bay, including the RADCAD site. Anadromous fish migrate through the area on their way to spawn in the Snohomish River, including four species of salmon, and searun steelhead, cutthroat trout and Dolly Varden. The juvenile fish out-migrate through Port Gardner, staying in shallow water. Migration occurs all year-long, but the peak adult upstream migration occurs from July through December.

Port Gardner area fish also include non-anadromous ones: herring, rockfish, flounder and sole are the principal commercial species. There are also halibut, surf perch, cod, Pacific hake, and pollack. The RADCAD site is believed to be a nursery area for hake. Shrimp are found in and near the RADCAD site primarily at water 130 to 260 feet in depth, at seasonally variable densities. Shellfish, while abundant in the Snohomish estuary and adjacent shorelines, are not currently being commercially harvested, due in part to poor water quality and interferences from other activities in the area. Shellfish harvesting is a traditional activity of the Tulalip Tribes. The open waters of the Bay also are used by a variety of birds, including diving ducks, grebes and guillemots, and by harbor seals and sea lions.[2]

III

Crabs

Dungeness crabs are found in high concentrations in Port Gardner. (See Exh. A-5, at pp. 26-31, and Exh. R-1 trawl studies.) The crabs are harvested commercially and recreationally. Very high concentrations of gravid (pregnant) egg-bearing female crabs are found at the original Navy disposal site ("CAD"), at densities never before

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[2] See, in particular, Exh. A-5, U.S. Dept. of the Interior Fish and Wildlife Service, Report on the Impacts of the Proposed Navy Homeporting Project, Everett, Washington (January 1987), for a detailed report on the area's fish and other wildlife resources.

observed in Puget Sound, leading the site to be called "Crab Condo." (Attachment 1) This concentration led the Navy to select an alternative site for sediment disposal: the current RADCAD site.

The crabs are not randomly located throughout Port Gardner, but are found in specific locations that change during the year. This change is due to different biological requirements over the year, such as food availability, breeding and procreation needs, and so forth.

The female crabs carry the egg masses on the outside of their bodies from about October-November, for three months, to about December through March. During this time they bury themselves in the sediment. The eggs hatch from about December through March, and during the larval stage are found in the sediments. About early June, as juveniles, they are found in intertidal waters.

The RADCAD site itself has a lower crab concentration than the previous CAD site. Surprisingly high concentrations of gravid females are found at 260 feet water depths, buried in the bottom sediments, at depths where crabs were previously thought not to inhabit. (Gravid females were also found at depths up to 328 feet.) Why the pregnant crabs bury in the sediments is not currently well understood. While buried they are relatively immobile. Male crabs have been observed to be able to dig out from under 6 inches of sediment. The buried female crab's ability to dig out, if artificially buried by more sediments, has not been studied.

RADCAD is closely surrounded on two and a half sides by high concentrations of crabs. (See Attachment 2, from Exh. R-1, June 1987 Cruise Report, Fig. 4.) There are the very high concentrations of gravid females also within these 1,000 feet. The nearby female crab population appears highest during June.

It is estimated that 800 on-site adult crabs will be killed directly from the Homeport sediment being dumped on top of them. Larval and juvenile crab will also be impacted. Mortality will also result from respiration, ingestion, and by absorption of contaminated sediments through the soft tissue. Even clean sediments will cause mortality due to respiratory problems and secondary infections. The amount of such mortality depends upon the amount of sediment mass loss, whether an area larger than just the RADCAD site is impacted, the amount of contaminated sediment exposed, how long it remains exposed, and so forth.

Suitable crab habitat is dependent upon many factors, including the availability of food, the proper sediment grain size and composition, the existence of non-toxic sediments, and so forth. Loss of habitat can even more critically affect crab population long-term than outright impact mortality. Displaced crabs (and other marine species) which have lost habitat do not simply "move over" to another location. That "other location" is already maximized for the particular species, i.e. at its <u>biological carrying capacity</u>. Therefore, loss of habitat long-term means of population loss, absent mitigation by the creation of new habitat.

The magnitude of such population loss will critically depend upon the care exercised during the disposal operation, and in particular whether sediments deposited unconfined are truly clean, whether contaminated toxic sediments are effectively isolated from the aquatic environment, and whether sediments are deposited off-site in significant volumes or depths.

IV

The Navy plans to dispose of 3,305,000 yd^3 of East Waterway sediments during two years of dredging. In comparison, in all of Puget Sound over 15 years (1970 to 1985), only 6,800,000 yd^3 of dredged materials have been disposed unconfined in open-water, or 450,000 yd^3 annually. Homeport's 3,300,000 yd^3 is equal to 1 2/3 World Trade Center Towers (New York City) in volume. The contaminated sediments (identified to-date) alone equal 1/2 a Tower. Clearly, the Homeport sediment disposal operation is massive in scale.

V

Berm Stage

Beginning in 1988, the Navy plans to clamshell dredge 500,000 yd^3 of "clean" material primarily from the outer harbor. A five yd^3 capacity clamshell dredge will be used, with a dredging tolerance (accuracy) of one foot in depth. The material will be transported in 4,000 yd^3 capacity barges to the RADCAD site. There the barges will be positioned through use of advanced navigational equipment, over the Berm location within the site. (See Attachment 3;

this RADCAD site diagram is from Exh. A-11, the Final Monitoring Report, is also referenced in the Shoreline water permit's pass/fail criteria, and was part of the water quality certification's public notice. All disposal boundary references hereafter, are to this permit diagram.)

Once the barge is properly positioned, the bottom will be opened and the sediments released, to fall through 310 feet to 430 feet of water to the bottom of Port Gardner Bay. It is estimated one barge dump will cover 20 acres of Bay bottom.

This Berm stage has three main purposes:

1. to provide a learning experience for the Navy and its contractors in using the sophisticated navigational equipment to accurately position the barges, and in tracking and monitoring the sediment plume;

2. to provide, by removing 500,000 yd^3 from the total sediments needed to be dredged, a more uniform ratio of "clean" to contaminated sediments remaining in the East Waterway for the subsequent Phase I stage. In that way the Phase I capping could be a more accurate test for Phase II in terms of "clean"/contaminated sediment ratio; and

3. to provide a barrier berm to help lessen the lateral spread of dumped sediments during Phases I and II disposal.

The current shoreline permit does not have any performance

pass/fail criteria governing the Berm stage. After the Berm stage, Phase I disposal would be allowed to proceed, unless no discernible berm whatsoever is detected.[3]

VI

The Shoreline permit requires that the Phase I operation meet the following pass/fail criteria:

1. Significant thickness of cap material shall not exceed the second year construction boundaries or the easterly -340 foot contour line as shown in the referenced public notice. [E.g., Attachment 3] Significant thickness of dredged material shall be considered as > [i.e., more than] 6 inches. This criteria is exclusive of an accident or mechanical failure of the hydraulic pipeline system offsite.

2. All contaminated material > 3 cm thick shall be covered with cap (native) material. However, it shall be demonstrated that 95 percent of the contaminated material 3 cm thick is covered with a minimum of one meter (3.28 feet) of cap (native) material. (If contaminated material cannot be visually distinguished from native material the contaminated material shall be determined as material with a chemical concentration above the Maximum Level One [ML 1] as defined in the Puget Sound Dredge Disposal Analysis Technical Appendix - Evaluation Procedures Preliminary Draft (November 5, 1986) and subsequent drafts and final documents.)

3. No contaminated material > 3 cm thick shall be found 500' [feet] outside of the first years boundaries for contaminated material or outside of the second year construction boundaries, whichever is less.

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[3] DOE conceded that this does not constitute a pass/fail criterion.

4. Approval of the boundaries for the second years disposal shall also be contingent upon a demonstration, based on two years data, that adult female crabs within the second year boundaries of the proposed disposal site have a mean annual density of less than 100 female adult crabs per hectare [4 acres] and such crabs are less than 5 percent of the total female adult crabs within the area bounded by 48.0 degrees north latitude and 122 degress 17.5 minutes west longitude, the 110 meter [approx. 363 feet] depth contour and the MLLW mark, and the disposal site greater than 110 meters deep. [Exh. A-6; Water Quality Certification incorporated as Shoreline Permit condition.]

Criterion 4 has already been met, so the second year boundaries are as shown in the RADCAD site diagram (Attachment 3).

VII

Phase I Contaminated Disposal

Dredging and disposal of contaminated sediments will only occur from July 16 to November 30 of each year.

Following the Berm stage, approximately 97,000 yd^3 of contaminated sediments from the outer to middle harbor areas will be dredged by clamshell. An estimated 2% mass loss of contaminated sediments will occur during dredging. This dredging method was chosen, in part, to help maintain the "black mayonnaise" sediments' structural strength/cohesion. (These contaminated sediments already have a high water content.) Promoting structural cohesion will help keep the contaminated sediments together, once dumped, as the sediment plume descends through the water column. Moreover, promoting cohesion will make the subsequent capping operation more feasible, when "clean" sediments are dispersed on top to form a cap.

The Phase I contaminated dredging will be done to at least one foot below the previously visually-identified "black mayonnaise" layer. This one foot below "overdredging" is designed, in part, to try and ensure that all contaminated sediments are removed. If, however, the contractors dredge more than two feet below that visual line, they will be financially penalized. So "overdredging" beyond a certain point is actively discouraged.[4] Within the clamshell bucket, the "black mayonnaise" layer will be mixed with the gray native sediments. No overflowing of the barge will be allowed.

The contaminated Phase I sediments will be transported to RADCAD by barge, the barge positioned over RADCAD's Phase I contaminated boundary (Attachment 3), and the sediments released to descend through the water. During the descent, due to winds, currents and other physical forces, up to 3% of the contaminated sediments (by volume) will be lost, for an estimated total contaminated sediment mass loss of 5%. Finer sediments, which are more vulnerable to transport, will be lost at higher percentages. This 5% mass loss figure, while used throughout the EIS documents and during the hearing, has not been incorporated as a permit pass/fail criterion.

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4 Even with "precision dredging, however, a 5 yd^3 clamshell bucket only has a one-foot accuracy tolerance (range). So this overdredging is also necessiatated by the equipment's limitations.

The descending plume will hit the Bay bottom and surge laterally, with the heavier debris staying in the the center of the dump. It has been predicted that successive barge dumps will form a contaminated mound.

Under the shoreline permit criteria (Finding of Fact VI, above) contaminated sediments less than 3 cm. (approximately 1.2 inches) in depth, regardless of where located, on or off-site, will not have to be capped. For thicknesses greater than 3 cm., 5% of these contaminated sediments are also not required to be capped.

VIII

Capping of Phase I

Capping of Phase I contaminated sediment is to be completed by January 14, 1989. Approximately 239,000 yd^3 of "clean" sediments will be hydraulically dredged (by suction) from the outer and middle harbor areas. The sediments, in a liquified slurry form, will be sent by pipeline 9,000 feet to the RADCAD site. There, by a 50-foot submerged pipe with diffusers, the sediments will be released under pressure (referred to as a "jet" of material) over the Phase I first year construction boundary (Attachment 3). The pipe will be moving in a predetermined path, with repeated passes over the first year area, to provide a minimum of one meter of "clean" cap over the contaminated Phase I sediments. Cap consolidation, i.e. loss of height and width after placement due to compaction, was conservatively estimated by the Corps to be up to 50%.

Mass losses of these "clean" sediments into the aquatic environment when dispersed into 265 feet of water, will range from 3.2% to 26.3%, depending upon the "jet" discharge rate chosen. (Exh. A-2B, Navy Draft Supplemental EIS Vol. 1 Technical Appendices, Palermo, et al., Evaluation of Dredged Material Disposal . . . (May 1986).) The mass losses of cap material will be higher at RADCAD, since that site is 45 to 165 feet deeper than the 265 feet used by the Corps.

The shoreline permit criteria do not place any restrictions on cap mass losses during any phase.

If the Phase I pass/criteria are not met, then by this permit the Navy could not proceed to Phase II disposal, and would then have to dispose of the remaining East Waterway sediments at an as yet not identified upland site.

IX

Monitoring

During and after Phase I, the Navy will have in-water (in situ) monitoring conducted to determine compliance with the given permit pass/fail criteria (Finding of Fact VI, above).

The monitoring will also include biological monitoring. This in-situ biological monitoring, however, is not a permit pass/fail criterion. The reason for this is clear. We find that this biological monitoring will not able to detect any but the most catastrophic environmental damage caused by the disposal. In

recognition of this limitation, the DOE has relied, instead, on placement pass/fail numerical criteria. We do find, however, that the biological monitoring between Phases I and II is likely to provide useful information, separate from information for decisions related to this permit.

Phase II

If the Navy demonstrates compliance with the permit's pass/fail criteria, DOE will authorize it to proceed to Phase II.

Phase II disposal involves a much greater volume of sediment, at least 2,469,000 yd^3 from the harbor, and more if additional clean cap material is needed. 831,000 yd^3 of "contaminated" sediment will be clamshell dredged from the inner harbor, and barge-dumped over the RADCAD second year contaminated boundary area (Attach. 3). Within the same year, 1,638,000 yd^3 of "clean" material will be hydraulically dredged, sent as a slurry by pipeline, and released over the second year construction boundary to form a cap over the contaminated sediments.

There are no Phase II pass/fail permit criteria. Evidence shows, however, that DOE still requires 95% of Phase II contaminated material greater than 3 cm. to be covered with a one meter cap.

If there is not sufficient clean cap material available from the East Waterway dredging, the Navy plans to obtain additional sediment from ongoing dredge maintenance operations, including ones in the Snohomish River. If this were done, total sediment disposal at RADCAD would be greater than 3,305,000 yd^3.

X

Disposal: Currents, Wind and Sediment Transport

The RADCAD 380-acre site extends approximately 6,000 feet east-west, and 3,800 feet north-south. Over time Snohomish River sediments have been deposited in the area. The site has an average slope of 2%. (The area for Phase I contaminated dumping has a slightly steeper slope.) RADCAD is downslope from both the CAD site to the east and areas to the south, both of which have high crab populations. It is in part at an equal elevation with high crab populations to the northeast (Attach. 3).

Average bottom currents in the area, tested over a 31 day period, are 3.5 cm. (instantaneous) with a maximum 18 cm. observed. Surface currents are higher. Once sediments have been deposited on the Bay bottom, such currents are unlikely to cause significant sediment re-suspension or mound erosion. While the sediments are falling through the water column (in the "plume" or "jet"), however, the observed currents, winds, and other physical forces are sufficient to move sediments off-boundary areas (Attach. 3). This is particularly true when disposal occurs near a particular boundary. Moreover, fine sediments are more easily transported and will be transported outside particular boundaries at a higher percentage rate than predicted for the average overall sediments. These finer sediments have higher organic chemical concentrations.

XI

Everett dredged sediments are a complex mixture of materials deposited from industrial activities and sediments from the Snohomish River. Industrial discharges have included effluent from pulp and papermill operations, urban runoff, and other activities associated with a heavily urbanized setting. Chemicals including both organic and inorganic ones, polyaromatic hydrocarbons ("PAHS"; both low and high molecular weight), polychlorinated biphenols ("PCBs"), metals, in sum a complex chemical soup. In 1984, English sole, a bottom fish which inhabits the East Waterway, were found to have liver cancers. It is uncontroverted that East Waterway surface sediments are toxic to the aquatic life. (See Exh. A-16M, Puget Sound Dredged Disposal Analysis ("PSDDA"), Draft Technical Appendix, (January 1988), at pp. II-37, II-40, etc.; Exh. A-18, Malins, et al. Chemical Pollutants in Sediments and Diseases of Bottom-Dwelling Fish in Puget Sound, Washington, 18 Environ. Sci. Technol. 9 (1984) and so forth.)

XII

It is well-recognized that to control pollution from disposing dredged sediments in the water, those sediments with significant concentrations of toxic chemicals have to be controlled. Chemicals in exposed sediments interact with the aquatic environment in a number of ways. If the sediments become aerobic (with oxygen) and turn acidic, metals can dissolve into the water. Chemicals which are not water-soluble, such as PAHS and PCBs, adhere to fine grain

organically-rich sediments, such as those found in the East Waterway. The sediment organic chemical concentrations may be thousands of times higher than the concentrations detectable in the water column itself. Water column tests alone (i.e., elutriate tests) are not adequate to measure such toxic chemical concentrations in sediments. (See, e.g., EPA Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 40 CFR Pt. 230.61, 45 F.R. 85336 (December 24, 1980).) Rather, a combination of sediment analytical chemistry tests, and biological tests are needed. Id. Since 1984 oyster larvae and amphipod biological tests have been used in a regulatory manner in Puget Sound on sediments. (See Finding XV, below.) Since 1985 the microtox luminescence sediment test has been available and has been used on sediments. All these biological tests, as well as bioaccumulation tests, have been used in this project.

XIII

There are a variety of pathways for marine life to take in such chemically-laden sediments. Organisms that live in the sediments, such as benthic organisms, may ingest the sediments or absorb them through their body. Other species may eat these bottom-dwellers or take in their wastes. The chemical concentrations may increase ("bioaccumulate") up the food chain. Filter feeders such as clams and mussels may also concentrate chemicals. Fish are somewhat more efficient than crustacea (including crabs) and shellfish at metabolizing PAHs, transforming them into other compounds. However,

some metabolites formed from these chemical breakdowns have been demonstrated to have chronic toxic effects (DNA alteration) on fish, and may be even more toxic to the fish than the original chemical.

XIV

The key question then is, which Everett sediments have chemical concentrations at levels that will not be toxic to marine life and can therefore be disposed of as "Clean", and which sediments if disposed in Port Gardner will have to be confined and isolated from the aquatic environment, i.e., are "Contaminated".

There is no dispute that the surface "black mayonnaise" sediment layer in the Harbor is contaminated. The harbor marine life reflects this, e.g., the benthic population level is depressed, and those benthos that exist are pollutant-resistant. Few bottom fish are found, and the English sole have liver tumors. The Navy is required to treat this entire black mayonnaise layer and one foot below it as contaminated. (The preceding Phases I and II contaminated sediment volumes, i.e. 97,000 yd^3 and 800,000 yd^3 reflect this requirement.)

But more than 2,375,000 yd^3 of sediment will be dumped during all three stages, Berm and capping Phases I and II, into Port Gardner's open-water and remain unconfined. Therefore, it is critical that this massive volume of material be, in fact, Clean, and not have chemical concentrations likely to cause acute or chronic long-term toxicity to marine life. Because over 1,977,000 yd^3 of this will be

disposed of hydraulically, where mass sediment loss rates are as high as 26%, assuring "clean" is Clean is even more critical. (See Finding VIII, above.)

XV

Aware that sediments were contaminated, the Navy, in conjunction with the Corps, undertook to determine the dividing line between contaminated sediments and those sufficiently clean to be disposed unconfined. (This distinguishing process will be referred to as "sediment characterization".) In 1985 through 1986, the Navy had chemical and biological tests done, referred to as Phases 1, 2 and 3 (no correlation to the dredge phases; see Finding XVII, below).

XVI

Before describing the Navy's efforts, some brief background is necessary.

Puget Sound Sediment Characterization Efforts in the 1980s:

Fourmile Rock

In October 1982 the City of Seattle established an interagency task force to review the problem of disposing of contaminated dredged sediments. (See generally, SHB No. 84-41, Bonnie Sadleir-Orme v. City of Seattle, et al.) The task force included a broad array of governmental agencies, including the City of Seattle, DOE, the United States Environmental Protection Agency, the Corps, and the National Oceanographic and Atmospheric Administration. As a result, interim sediment criteria to prevent further degradation of the already

contaminated Fourmile Rock site were developed. These criteria became a part of the Fourmile Rock shoreline permit's conditions, as issued in June 1984. See, Sadleir-Orme, supra. The permit was for a maximum of two years, during which time unconfined sediment disposal from many different dredge sites would be allowed to continue. (Exhs. A-24, and A-16M at pp. II-12 through II-16) The criteria were not based on preventing a clean site from being adversely environmentally affected.

The 1984 Fourmile Rock criteria required that sediment cores be collected from the dredge sites, tested for physical and chemical properties, and if necessary tested biologically. Sampling and testing plans were required for each dredge area for specified chemicals and groups of chemicals. (See Attachment 4 for the chemicals and their concentration limits.) The criteria required more extensive sediment chemical and biological tests for sediments from dredge sites of high concern (e.g. Duwamish River, Elliott Bay waterfront, etc.), than for low concern areas. Amphipod bioassay and oyster larvae bioassay were required for sediments from high and moderate concern areas. The criteria further required that if, during bioassay testing, control group mortality was greater than 10%, or if oyster larvae control group abnormality was greater than 10%, the bioassay had to be repeated.

For each sediment chemical core test done:

1. if all listed pollutants were less than 110% of disposal site background levels, in-water [unconfined] disposal was allowed;

2. if one or two listed pollutants were at levels from 110% to 125%, in-water disposal was allowed only if bioassay criteria were met;

3. if any three or more pollutants exceeded 110%, no in-water disposal was allowed; and

4. if any listed pollutant or groups of pollutant exceeded 125%, no in-water disposal was allowed. (Exh. A-16M)

The Fourmile Rock site was used for dumping and then closed in June 1987.

Port Gardner and PSDDA:

The Port Gardner interim criteria for unconfined sediment disposal were developed in 1985, and were transmitted in final form to the City of Everett in February 1986. (Exh. A-16M, at pp. II-17 and II-18.) These criteria were also based on preventing further degradation at an existing dump site. The chemical concentration "cut-offs" were more restrictive than the Fourmile Rock Criteria. (Attachment 4)

In February 1985 the Puget Sound Dredged Disposal Analysis project ("PSDDA") began. The Corps is the lead federal agency joined by EPA, and the Washington Department of Natural Resources ("DNR") is lead for the State of Washington joined by DOE. The objectives of PSDDA, using an extensive existing Puget Sound data base, are to:

1. establish sediment evaluation procedures so that materials suitable for open-water unconfined disposal are properly identified; and

2. identify open-water sites in Puget Sound suitable for receiving such sediments. (Exh. A-16M)

DOE has incorporated PSDAA criteria in the permit's pass/fail criteria. (See Finding VI, above). As of the hearing date, the criteria have not otherwise been adopted as final.

Like the previous 1984 Fourmile Rock criteria, PSDDA uses a two-tiered approach. Chemical levels are based upon apparent biological effects threshold ("AET"). If all chemical concentrations are below the screening level ("SL"), then disposal has been shown to not cause sublethal toxicity, the sediments are "Clean", and are safe for unconfined disposal.[5] If concentrations are between SL and "ML-2", sediments are "Clean" only if they subsequently pass specified biological tests. If the concentration is greater than ML-2 the material cannot be disposed in water unconfined, as apparent biological effects will occur (in all biological indicators). (See Exh. A-16M, at pp. ES 14-15, Sections II. 7-2 and .8-2; also Attach. 4.)

In characterizing sediments, PSDDA uses the "dredge units" approach which is "routinely employed in the design of capping projects, . . . " (Exh. A-16M, at II-46). Several core samples are taken within that volumetric unit, are composited and chemical testing

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[5] For some chemicals, the 1986 Port Gardner interim criteria levels are more restrictive than PSDDA SL 1 screeening levels. (See Attach 4)

is done on the composite. The PSDDA dredge unit size depends on the sediment area's "rank", i.e. high versus less contamination, and the sediments' depth below surface sediments.[6]

XVI

Navy Phase 1 Sediment Characterization

In late 1984 the Navy had 19 sediment core samples taken in the Everett harbor at varying depths. (These are known as the "E" series; see Exhs. A-16F and R-19.) Using visual means to distinguish between the black mayonnaise and the gray native sediments, the 19 core samples were divided into top and bottom samples. (E-4 and E-13 also divided into a middle sample.) The discrete samples were then tested chemically for: seven metals, some low and high molecular weight PAHs, ethylbenzene, total xylene, and total PCBs.

But there are serious significant data gaps in the Navy's testing. The cores were not tested for other organic compounds, including numerous ones with known toxic properties, including: chlorinated hydrocarbons, volatile organics, phenols, and phthalates. (Exh. A-16M) (Since only some PAHs were tested for, the weights

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[6] For example, in areas with a low-moderate rank (i.e., available data indicates few or no sources of chemicals of concern likely to cause significant biological concern, but data insufficient to so affirm), sediments four feet below surface are to be tested in 48,000 yd^3 units. Sediments with a moderate rank (i.e. data incomplete but some chemicals of concern nearby), those below four feet are to be tested in 24,000 yd^3 dredge units.

ascribed to the total PAH groups are likely to be underestimated.) In addition, the visual methods used to divide contaminated from supposedly clean samples are scientifically insupportable. The "E series" chemical results, and subsequent Phases 2 and 3 testing show the error of assuming that contamination is only to be found in the this visually distinguishable black mayonnaise layer. (See Findings XVIII and XIX, below)

The Phase 1 chemical analytical tests showed that contamination levels in some areas of the harbor increased, rather than decreased, with sediment depth. (This confirmed a 1984 Corps study.) Supposedly "clean" native bottom samples exceeded Puget Sound surface sediment background levels for cadmium and copper. Six inner harbor bottom samples (2B, 3B, 5B, 6B, 8B and 9B i.e. Phase II dredging) showed significantly elevated chemical levels.[7] Since core samples have not been taken and chemically tested at depths below these respective bottom samples it is not now known at what depths clean sediments will be found. The tests also show that sediment contamination thickness and depth varies; there was testimony that

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[7] Two middle samples showed PAH levels exceeding surface levels, and in one instance exceeded PSDDA SL screening levels by 70 times. For the bottom core samples, 3 exceeded Port Gardner criteria for low molecular weight PAH (3B, 6B and 8B), 4 exceeded SL for low molecular weight PAH (2B, 3B, 6B and 8B), 2 exceeded SL for high molecular weight PAH (2B, 3B, with 9B very close), 4 exceeded SL for napthalene (3B, 5B, 6B, 8B), and so forth.

there was considerable contaminant depth difference from as little as 33 feet away.[8] The proposed overdredging, which goes only 1 foot below the black mayonnaise, clearly does not assure that all contaminated sediments will be removed, or that we can determine what chemical concentrations will be present in the remaining "clean" sediments.

XVIII

Phase 2 Tests

The Navy's own work acknowledged the Phase 1 chemical testing deficiencies. As a result, the Navy required biological testing to demonstrate that the bottom sediments were clean. But the subsequent biological tests (Phase 2, toxicity for amphipods, bioaccumulation in clams and mussels) did nothing of the kind. To the contrary, amphipod mortality and PAH bioaccumulation were high.

The Navy and Corps had 20 more sediment core samples taken in the harbor in 1985. (In so sampling, they attempted to come within 100 feet of the Phase 1 "E series" core sample locations.) Again, using visual methods, the core samples were divided into the black mayonnaise layer and the native sediment layer. From the 20 "native" bottom samples, six composites were made. (Exh. R-20, Fig. 1; Exh. A-16F.) These composites are referred to as the "EEW series".

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8 This is not altogether surprising, since parts of the harbor were dredged as recently as 1978, and industrial wastes are not necessarily deposited uniformly throughout the area. Moreover, different chemicals have different vertical leaching rates (i.e. the rate of movement through sediments over time).

Bioaccumulation studies were done with two filter feeders: Macoma clams and Mytillus mussels. The tests were run for up to 21 days, and the PAH and PCB accumulation levels were compared to results using Puget Sound background sediments and to results using "clean" Sequim sediments (known as the "control group"). The results showed significant chemical accumulation levels from the Everett bottom "clean" sediments, with a PAH level in one instance 16 times the level found in the control group.

Amphipod bioassay tests were also conducted, with control groups exposed to Sequim Bay sediments. The amphipod testing, however, ran into a number of difficulties. Most critically, the control group's average survival rate was very low in one series, i.e. 63%. A second control group of amphipods were tested, with amphipods taken from an entirely different location, making valid scientific comparisons questionable. The survival rates between the two control groups tests varied by 19%. (As one witness said: "No amount of flawed data makes good data".) The amphipod survival rate in the Everett composite "native clean" sediments was as low as 60%.[9] Behavioral observation also indicated the amphipods were trying to avoid staying in the Everett sediments, a sign of possible sediment contamination or other composition problem.

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[9] Composites EEW 1 (cores E1 and E4), EEW 5 (cores E12, E14, E15 and E16), and EEW 6 (cores E17, E18, E19 and E20) were particularly problematic (see Exh. R-20, at Fig. 1, Table 10, and Table 12.

At that point, either more biological testing was necessary, or the sediments should have been treated as contaminated, i.e. not acceptable for unconfined disposal. Neither of these sensible alternatives was chosen, despite cogent, informed resource agencys' concerns.

The proposed overdredging does not solve the deficiences in sediment characterization. The composited bottom samples, taken from areas below the "overdredge" line, show criteria and screening levels are exceeded. Moreover, the "dredge units" tested were far too large. The chemical testing had one test per 130,000 yd^3 (e.g., 19 analyses for 2,477,000 yd^3 of "clean" sediment). The biological testing was done at one composited sample test per 412,800 yd^3 (e.g., 6 composites for 2,477,000 yd^3).

We find that the tests did not prove the native bottom sediments to be clean. To the contrary, we find from all the evidence that more probable than not, some of the bottom native sediments will have at least a chronic toxic effect if disposed unconfined in Port Gardner Bay. We find that further sediment characterization is necessary to determine which bottom sediments are clean (suitable for unconfined disposal) and that such characterization is feasible.

XIX

Phase 3 Testing

In May 1986 the Corps made an additional effort to characterize the East Waterway sediments, to demonstrate that the gray native

sediments were clean. (Exh. R-21) A clamshell took an 8 yd^3 "grab" sample. Biological tests were done. The oyster larvae bioassays showed statistically significant level of abnormalities. A geoduck bioassay test showed complete acute toxicity, i.e. no survivors. (This test is still in the experimental stage.) Microtox testing showed three times higher toxicity levels than with Sequim Bay sediments. (It was conjectured at the hearing, but not supported by evidence, that the grab sample was somehow inadvertently contaminated by "black mayonnaise sediments".) The native sediment sample, taken outside the Homeport area to be dredged, did show toxicity and further proves the invalidity of using visual methods to distinguish "clean" from contaminated sediments.

XX

Experimental Disposal

The Navy's confined water disposal is experimental in significant ways.

Field Data

To predict the mound formation and capping, field data primarily from operations on the East Coast were used. Mounds have been formed from barge-dumping in waters up to 210 feet deep. Barge-dump capping has been done in depths up to 70 feet. Hydraulic placement of a cap has never been done in the field at any depth.

In particular, evidence showed that at the Foul Area Site (off Boston), a mound was attempted to be formed in water 160 to 300 feet

deep. Sophisticated bathymetry depth sounding equipment initially could not even locate the barge-dumped sediment. Subsequently, an advanced underwater camera (similar to one planned for use during the Homeport monitoring) discovered, instead, a "flat pancake" 3,630 feet in diameter. Subsequent review revealed that the barge dumping had not been done with the specified required precision.

Barge-dumping formed a mound and a cap in 70 feet of water in Long Island Sound.

At a Portland, Maine site, a discrete mound was formed in water 140 to 225 feet. No capping was attempted.

Recent efforts to accurately predict a sediment barge-dump in the Duwamish River (Puget Sound) were not particularly successful. One barge-load (1,100 yd^3 of contaminated sediments) was dumped into 70 feet of water. Subsequent monitoring revealed that substantial amounts of sediment surged out of the target area.

XXI

Computer and Laboratory Data on Disposal

The Corps developed a computer model to simulate a single barge dump, to determine if a mound could be formed at depths of 265 feet (the original CAD site depths), and to calculate the sediment mass losses. (When the RADCAD site was subsequently selected, the results were mathematically adjusted for the greater 310 to 430 depths.) The model has never been field-tested, i.e. it has not been used to predict an event and then verified by subsequent in-field events.

From the single-dump model, and the field data, the Corps concluded that a mound could be formed and capped at the RADCAD site. We conclude appellants have not proven RADCAD disposal will fail, but they have proven that the disposal is experimental.

XXII

Bioturbation and Cap Integrity

A sediment cap's integrity, its' ability to effectively isolate contaminated materials from the aquatic environment, depends upon several factors: that the cap material is clean; that it be sufficiently thick and not be significantly eroded, and that it not be compromised by burrowing organisms. (Organisms turning over and moving sediment will be referred to here as bioturbation.)

The Corps did laboratory tests in an effort to determine how much cap was necessary. East coast polycheates (a type of sea-worm), breached a 50 cm. cap during a 40-day test. The Corps recommended, after considering the possible presence of geoduck at RADCAD, which are known to bury at last 50 cm., that a minimum 80 cm. cap was needed. (Exh. A-2B, Palermo, supra, (May 1986), at pp 24-25.) The Corps also conceded that additional cap beyond the 80 cm. may be necessary to compensate for erosion, consolidation or incorporation of the cap into the underlying (previously placed) contaminated sediments. Id.

Two marine organisms capable of significant burrowing have been found at the RADCAD site: a sea cucumber (Molpadia), and a shrimp

(Axiopsis Spinulicauda). The burrowing shrimp has been found buried in sediment up to 80 cm. in depth. A very close relative of this shrimp, Axiopsis Seratus, found in the tropics, is known to burrow more than 3 meters.

Based on all the evidence, we find that erosion and bioturbation are not likely to pose significant threats to the integrity of a one-meter consolidated cap. However, we also find that a one-meter unconsolidated cap is not adequate to isolate contaminants from the aquatic environment. Such cap, after consolidation, may be as little as 50 cm. (1/2 a meter) in height, less than the Puget Sound shrimp's known burrowing depth.

XXIII

Given the evidence and burden of proof in these appeals, the Navy is likely to be able to dispose of the sediments within the sites as identified (Attach. 3). Nonetheless, the disposal operation is experimental; it has not been field-verified. The shoreline permit, we further find does not provide sufficient operational pass/fail placement criteria to ensure that the disposal will not cause significant chronic long-term or acute toxicity to marine life in and around the site area.

Permit Pass/Fail Placement Deficiencies

During Phase I, contaminated sediments up to 3 cm. thick will be allowed up to 500 feet beyond the Phase I contaminated boundaries or the Phase II overall boundary. (Finding VI, above) There is no

pass/fail limits on the total amount of contaminated sediments less than 3 cm. that can be outside any boundary limits, and such sediments will not be required to be covered with clean material. An additional 5% of contaminated sediments that are greater than 3 cm. in thickness are not required to be covered with clean cap.

During Phase I capping material greater than 6 inches (approximately 15 cm.) will be allowed up to the second year Phase II boundaries (or the easterly -340 foot contour.) There are no placement limits for cap material less than 6 inches thick, nor any total volumetric cap mass loss restrictions. Given the proximity of high concentrations of crabs, high volumes of even truly clean sediments can smother adult and juvenile crabs, damage eggs, abrade tissues causing mortality or loss of reproductive capacity, destroy habitat, and otherwise damage the aquatic environment. Therefore, accurate hydraulic cap placement, a technique that has never been used before, must be timely tested in the field, and mass loss limits required. This is particularly important before Phase II disposal begins with its disposal of 800,000 yd^3 of already identified contaminated sediments.

There are no pass/fail boundary or mass loss restrictive criteria whatsoever for Phase II placement, when these 800,000 yd^3 of admittedly contaminated Phase II material will be dumped, and minimum of 1,600,000 yd^3 "clean" cap will be hydraulically released with potential high mass loss rates.

XXIV

Alternative Site - Smith Island

The Navy has analyzed Smith Island as a possible alternative sediment disposal site. Appellants have advocated the use of this site. This upland site is four miles from the East Waterway, adjacent to Steamboat Slough which is in the Snohomish River Estuary. The site is approximately 110 acres, the eastern portion in pasture, the western part a former log storage and sorting yard. The site is diked and separated from the Slough. It is, however, within the 100-year floodplain of the Snohomish River. In portions of the site, the soils are soft, peaty, and somewhat impermeable.

To use this site, the East Waterway sediments would likely be hydraulically dredged and conveyed as a slurry by pipeline. Known, proven engineering technology would be used on-site. First, the slurry would be allowed to settle. The separated-out water would then be placed back in the Sound. Estimated mass losses of sediments back to the Sound from these waters are 5%. With the use of chemical flocculants, this mass loss can be further reduced.

Two designs have been proposed, excavated and elevated. Both designs would require capping and perimeter dikes, but the elevated design's dikes would have to be higher. The excavated design would retain the wet sediments in an anaerobic (oxygen-less) state, preventing the mobilization of metals. But the sediments would be in direct continuity with the groundwater. The groundwater has a low hydraulic gradient and is brackish, not used for drinking water.

The elevated design would likely require the use of a liner, either clay or synthetic (or both in combination). Given the possibility of differential soil settling, a clay liner is more likely to retain its structural integrity, not tear. A leak detection system can be installed. The sediments in an elevated design, are more likely to become aerobic and can release metals into the water which remains in the sediment. This water, known as leachate, could be intercepted and the metals inexpensively removed, prior to the leachate's entering the ground water. The methods for controlling such possible groundwater pollution are known and feasible. We further find that the Smith Island disposal alternative overall involves known, proven technology that is state of the art. Upland disposal of sediments is clearly contemplated by the Everett Shoreline Master Program. (SMP Policy No. 5, see Conclusion of Law VIII, below.)

But the Snohomish River is the spawning area for four types of salmon, and steelhead and other searun trout. The downstream River's mouth and Port Gardner Bay estuary provide vital habitat for out-migrating juveniles while they adjust to salt water conditions. Given the site's location in a 100 year floodplain, adjacent to the Snohomish River estuary, disposing of high volumes of contaminated sediments presents some environmental risks. We find that the risks

are of a severity equal to those from using the RADCAD site, if RADCAD disposal is further conditioned as recommended in this Opinion.[10]

We further find that the Smith Island alternative more probably than not, poses less environmental risk than the RADCAD disposal, if RADCAD disposal proceeds without further conditions. In so finding, we are aware that if RADCAD disposal operation does not work, and the extant pass/fail criteria do not timely detect the problems, massive amounts of contaminated sediments will be under 310 to 430 feet of water, with the only remediation possible would be capping, which would have already failed. While such exposed contaminated toxic sediments might be physically "out of human sight", they would be in direct contact with Puget Sound marine aquatic life.

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[10] We find that sea surface microlayer research is in the early stages of development. The evidence presented to the Board is not sufficiently definite for the Board to reach any firm conclusions about microlayer environmental effects.

List of Attachments

1. RADCAD/Disposal Site Location (Exhibit A-3A; Fig. 3 in Corps Final Supplemental EIS, Vol. 1 (November 1986)).

2. Female Crab Concentrations June 1987 (Exhibit R-1; Fig. 4 in June 1987 Cruise Report).

3. RADCAD Site Diagram (Exhibit A-11; Fig. 1.4 in Final Report Dredging and Disposal Monitoring Plan (November 9, 1987).

4. Chemicals and Criteria Levels (Exh. A-16F (excerpt)).

List of Attachments

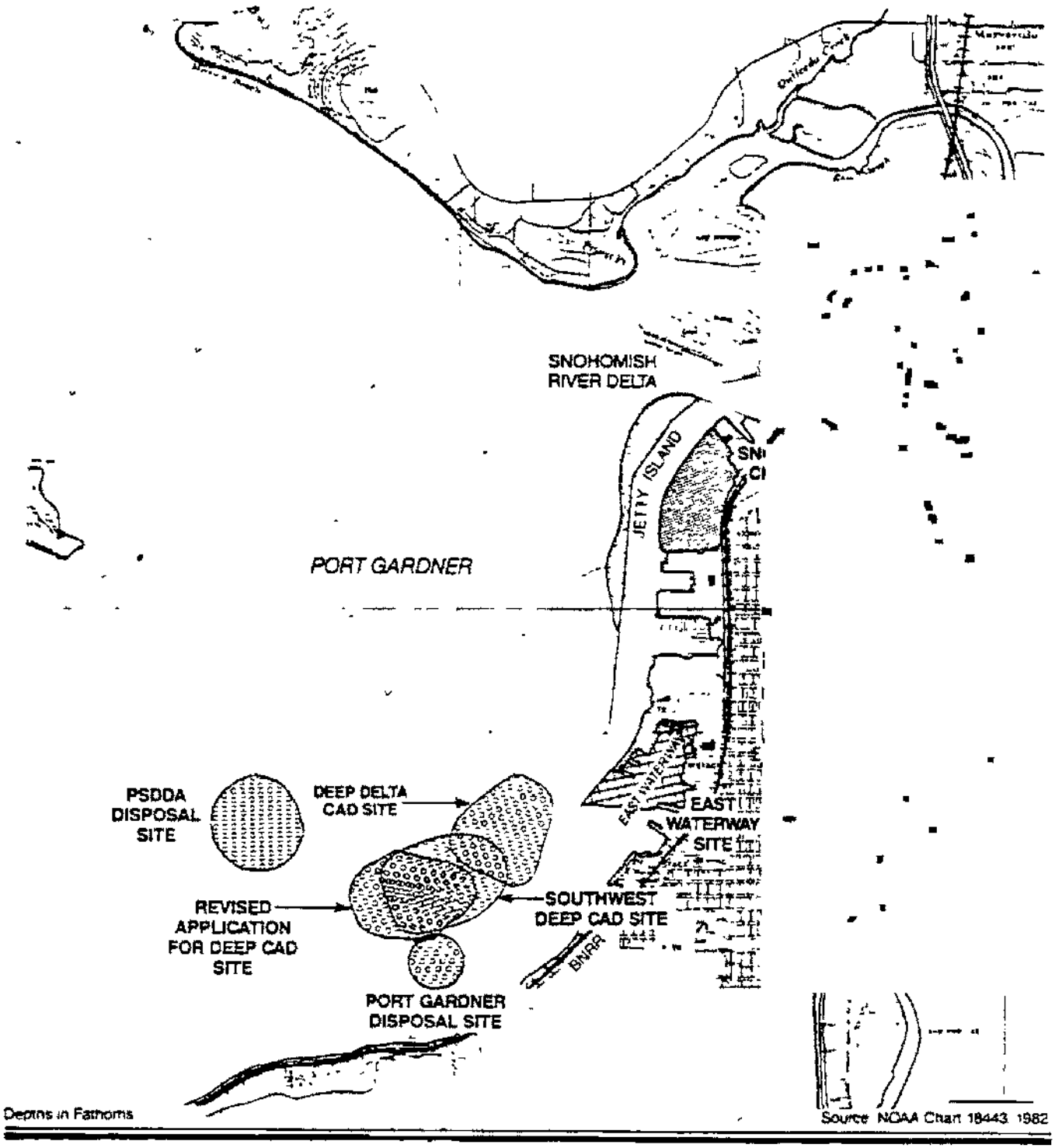

Figure 3-8.
Location Map of Dredging Area and Alternative Disposal Sites.

Attachment 1

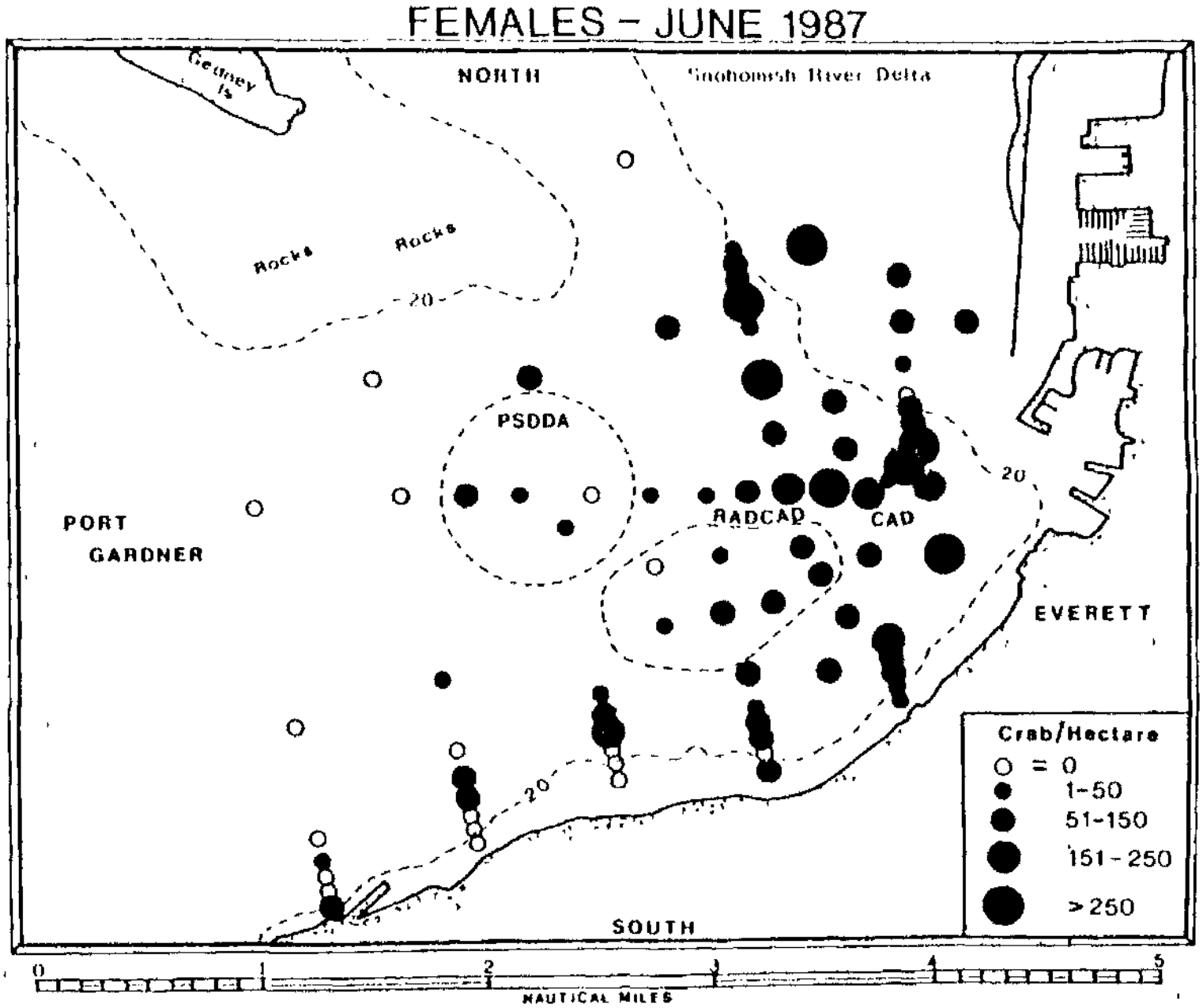

Figure 4. Map of Port Gardner showing the distribution of female Dungeness crab caught in the beam trawl during April 1987.

JUNE

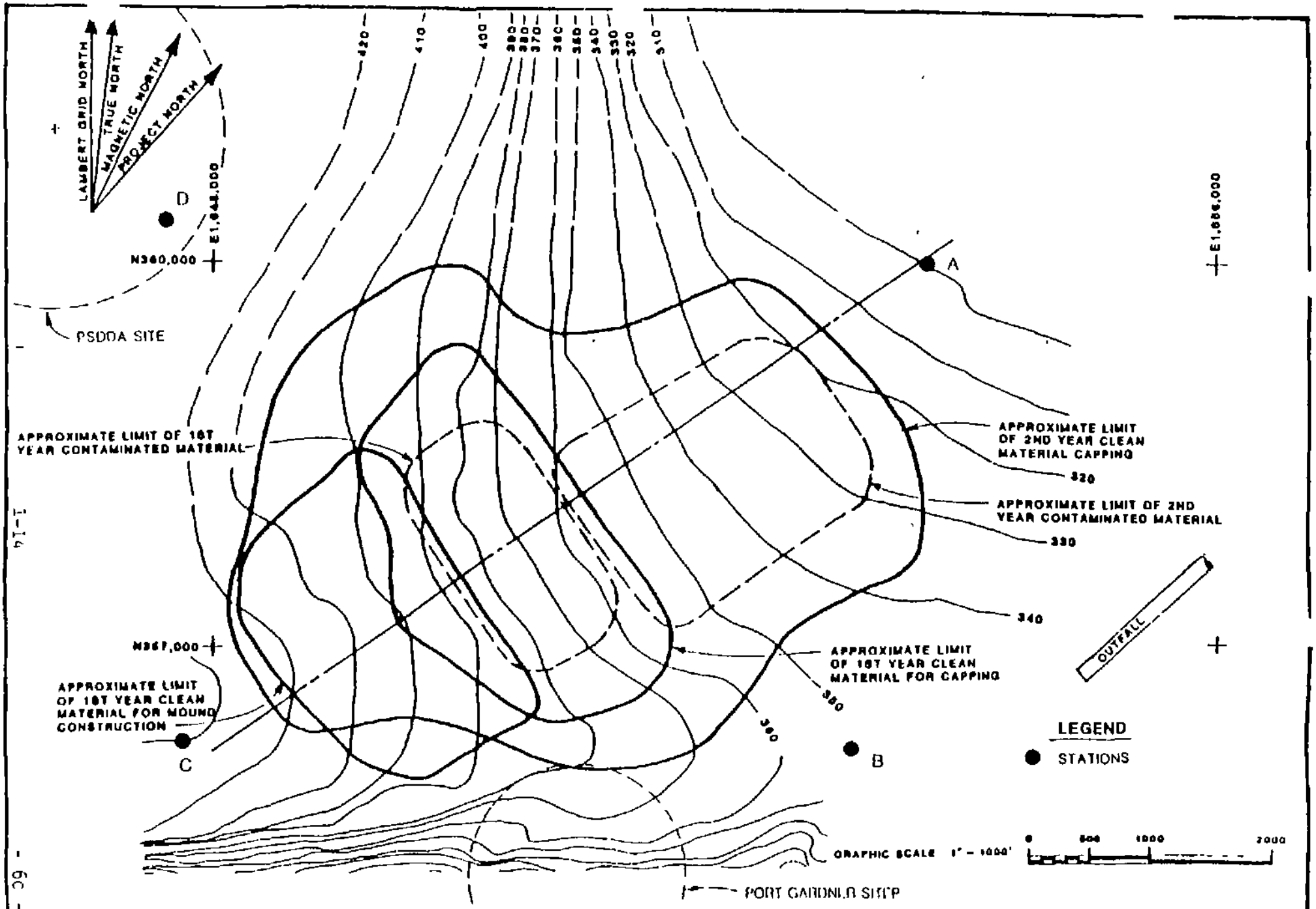

FIGURE 1.4 MOORED CURRENT METER STATIONS

EXHIBIT F

TABLE 2

Summary of Sediment Chemistry Data

Chemical	PSDDA SL	PSDDA ML[1]	4-Mile Rock 1251 Criteria	Pt. Gardner Interim Criteria	E1T	E1B	E2T	E2B	E3T	E3B	E4T	E4B	E5B	E5T
METALS (mg/kg dry weight ppm)														
Antimony	3.6	3.2	-	-	<6.4	-	4.8	-	-	-	-	-	-	-
Arsenic	70.0	85.0	19.0	13.5	10.7	8.99	4.9	9.19	7.2	6.94	8.5	13.6	9.3	42.1
Cadmium	0.96	5.8	0.9	0.7	0.55	0.70	1.01	0.335	2.85	0.532	2.44	1.47	0.272	3.36
Copper	80.0	310.0	115.0	68.0	127.4	44.8	89.2	57.3	112.0	35.6	53.8	105.4	47.7	116.1
Lead	90.0	300.0	150.0	110.0	84.0	4.0	47.4	10.1	98.6	11.6	22.8	73.4	10.7	134.2
Mercury	0.21	0.4	1.1	0.15	0.608	0.353	0.349	0.031	0.445	0.055	.284	0.402	0.072	0.653
Nickel	29.0	28.0	-	-	82.2	63.9	80.3	57.0	70.8	32.3	67.4	72.4	72.5	63.3
Silver	1.2	1.2	-	-	0.330	-	0.703	-	-	-	-	-	-	-
Zinc	160.0	260.0	450.0	165.0	537	80.5	338.4	67.9	355	64.2	340	205.0	91.4	394
ORGANICS (ug/kg dry weight ppb)														
Low molecular weight PAH	810	5200	855 a/	680 a/	21 181	ND	-	673	10 305	3012	4919	43 343	59	67 591
Naphthalene	210	2100			1 940	ND	-	189	1 569	227	969	13 280	24	8 337
Acenaphthylene	66	560			-	-	-	-	-	-	-	-	-	-
Acenaphthene	63	500			-	-	-	-	-	-	-	-	-	-
Fluorene	64	540			1 992	ND	-	71	1 171	149	552	5 674	6	5 756
Phenanthrene	320	1500			9 103	ND	-	246	5 487	372	1734	14 519	37	20 118
Anthracene	130	960			6 481	ND	-	116	3 472	132	1307	4 290	ND	9 122
2-Methylnaphthalene	67	670			1 425	ND	-	51	461	76	337	5 576	12	3 257
High molecular weight PAH	1830	12000	14 000	7 550	48 724	ND	-	2187	34 975	2270	28394	27 943	26	121 572
Fluoranthene	630	1720			9 836	ND	-	219	5 240	365	5491	7 800	0	37 554
Pyrene	430	2600			21 390	ND	-	461	11 341	642	11026	15 398	19	45 330
Benz(a)anthracene	150	1300			-	-	-	-	-	-	-	-	-	-
Chrysene	670	1400			12 375	ND	-	447	8 520	423	7745	3 457	ND	33 773
Benzo(b)fluoranthenes (B & K)	800	3200			-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	690	1400			4 710	ND	-	1065	9 465	810	1136	1 588	ND	24 916
Carcinogenic PAH	69	600			-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	120	230			-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	540	670			-	-	-	-	-	-	-	-	-	-
CHLORINATED HYDROCARBONS														
1,2-Dichlorobenzene	170	b												
1,4-Dichlorobenzene	76	110												
Dichlorobenzene	170	35												
1,2,4-Trichlorobenzene	51	31												
Hexachlorobenzene	78	78												
PHTHALATES														
Dimethyl phthalate	160	d												
Diethyl phthalate	97	d												
Di-n-butyl phthalate	1400	d												
Butyl benzyl phthalate	970	d												
Bis(2-ethylhexyl)phthalate	1500	d												
Diethyl phthalate	68000	d												
PHENOLS														
Phenol	120	420												
2-methylphenol	63	63												
4-methylphenol	670	670												
2,4-Dimethyl phenol	29	29												
Pentachlorophenol	400	b												
MISCELLANEOUS EXTRACTABLES														
Benzyl alcohol	57	57												
Benzoic acid	2160	650												
Dibenzofuran	54	540												
Hexachloroethane	1400	14000												
Hexachlorobutadiene	29	120												
N-nitrosodiphenylamine	28	40												
VOLATILE ORGANICS														
Tetrachloroethene	570	1400	-	-										
Trichloroethene	160	160	-	-										
Ethylbenzene	10	10	-	-	ND	ND	-	ND	1292	ND	1090	2030	11	3344
Total xylenes	40	100	-	-	ND	ND	-	ND	2006	ND	13703	2720	ND	5805
Total PCBs	130	130	760	380	5852/	ND2/	ND2/	-	3912/	ND2/	3912/	5812/	ND2/	6682/

ND = <1.0 ug/kg dry weight (ppb)

1/ Excludes 2-methylnaphthalene

2/ Aroclor 1254 only

NOTES

- Columns E1T through V2B are core sample chemical data from the First Battelle Sediment Chemistry
- Columns E5W1 through E5W6 are chemical data from composite "clean" native sediment samples analyzed in the Second Battelle Sediment Chemistry
- Columns X1B and X2B are, respectively, chemical data from Corps of Engineers analysis and the Third Battelle Sediment Chemistry analysis of split samples of the same "clean" native sediment composite sample
- Colums I-1B are chemical data from the Hart-Crowser chemical analysis of "clean" mound and cap material for Phase I dredging

A16F

Attachment 4 (Excerpt of Exh. A-16F)

TABLE II.8-4. SCREENING AND MAXIMUM LEVEL CHEMISTRY VALUES

Chemical	SL*	ML1*	ML2*	ML3*
METALS (mg/kg dry weight; ppm)				
Antimony	2.6	3.2	26	52
Arsenic	70	85	700	1400
Cadmium	0.96	5.8	9.6	19.2
Copper	80	310	800	1600
Lead	70	300	700	1400
Mercury	0.21	0.41	2.1	4.2
Nickel	28	28	49(a)	98
Silver	1.2	1.2	5.2	10.4
Zinc	160	260	1600	3200
ORGANICS (ug/kg dry weight; ppb)				
Low molecular weight PAH	610	5200	6100	12200
Naphthalene	210	2100	2100	4200
Acenaphthylene	64	560	640	1280
Acenaphthene	63	500	630	1260
Fluorene	64	540	640	1280
Phenanthrene	320	1500	3200	6400
Anthracene	130	960	1300	2600
2-Methylnapthalene	67	670	670	1340
High molecular weight PAH	1800	12000	18000(a)	36000
Fluoranthene	630	1700	6300	12600
Pyrene	430	2600	4300(a)	8600
Benz(a)anthracene	450	1300	4500	9000
Chrysene	670	1400	6700	13400
Benzofluoranthenes	800	3200	8000	16000
Benzo(a)pyrene	680	1600	6800	13600
Indeno(1,2,3,-c,d)pyrene	69	600	690(a)	1380
Dibenzo(a,h)anthracene	120	230	1200	2400
Benzo(g,h,i)perylene	540	670	5400	10800

TABLE II.8-4. (Continued)

CHLORINATED HYDROCARBONS				
1,3-Dichlorobenzene	170	b	b	b
1,4-Dichlorobenzene	26	110	260	520
1,2-Dichlorobenzene	19c	35	50a	100
1,2,4-Trichlorobenzene	6.4	31	64	128
Hexachlorobenzene	23	70	230	460
PHTHALATES(c)				
Dimethyl phthalate	160	d	d	d
Diethyl phthalate	97	d	d	d
Di-n-butyl phthalate	1400(a)	d	d	d
Butyl benzyl phthalate	470	d	d	d
Bis(2-ethylhexyl)phthalate	1900(a)	d	d	d
Di-n-octyl phthalate	68000	d	d	d
PHENOLS				
Phenol	120	420	1200	2400
2-Methylphenol	6.3	63	63(a)	126
4-Methylphenol	120	670	1200	2400
2,4-Dimethyl phenol	10c	29	29	58
Pentachlorophenol	140	b	b	b
MISCELLANEOUS EXTRACTABLES				
Benzyl alcohol	10c	57	73	146
Benzoic acid	216c	650	650(a)	1300
Dibenzofuran	54	540	540	1080
Hexachloroethane(e,f)	1400	14000	14000	28000
Hexachlorobutadiene	29	120	290	580
N-Nitrosodiphenylamine	22	40	220	440
VOLATILE ORGANICS				
Trichloroethene(e,f)	160	1600	1600	3200
Tetrachloroethene	14	140	140(a)	280
Ethylbenzene	3.7	33	37(a)	74
Total xylenes	12	100	120(a)	240

TABLE II.8-4. (Continued)

PESTICIDES				
Total DDT	6.9	14.9	69	138
Aldrin	5	g	g	g
Chlordane	5	g	g	g
Dieldrin	5	g	g	g
Heptachlor	5	g	g	g
Lindane	5	g	g	g
TOTAL PCBs	130	130	2500	5000

* The following procedures were used to develop SL, ML1, ML2, and ML3:

SL = 10% of ML2 or reference area concentration, whichever is higher, but no greater than the lowest AET for a range of biological indicators.
ML1 = Lowest Apparent Effects Threshold Value (LAET) for a range of biological indicators.
ML2 = Highest Apparent Effects Threshold Value (HAET) for a range of biological indicators.
ML3 = (ML2) x (2).

(a) The ML set for this chemical is based on a biological indicator with a definitive AET. These values may be adjusted upward based on another biological indicator which is currently represented by a "greater than" value for the AET (see the Sediment Quality Values report; exhibit E-21). For such biological indicators, the "greater than" value is the highest concentration of a chemical above which there has yet to be a bioassay that met disposal guidelines, and indicates that there were no impacted stations with chemical concentrations above this value (a requirement for setting definitive AET). During review of actual testing data, it was determined that these "greater than" values are useful estimates of the maximum level until more definitive data are available.

(b) No ML was originally set for these chemicals because definitive AET could not be set for any biological indicator (see discussion on "greater than" values in footnote a). ML values may be assigned for several of these chemicals based on the highest "greater than" value presented in the Sediment Quality Values report (exhibit E-21).

TABLE II.8-4. (Continued)

(c) For these compounds, the reference concentration was higher than the calculated value of SL so SL was set at the reference value.

(d) Biological testing should not be triggered solely by the presence of phthalates. Because these compounds are often present as laboratory chemicals of concern, the highest AET was used as the screening level and no maximum levels were set.

(e) These ML2 values were set using the Equilibrium Partitioning approach (Tetra Tech 1986j) because no AET values were available.

(f) For chemicals with ML2 values set by the Equilibrium Partitioning approach, ML1 was set equal to ML2, and SL and ML3 values were calculated from ML2 according to the formulas given above.

(g) SL for these pesticides was set to 5 times an assumed analytical detection limit of 1 ug/kg dry weight sediment. No sediment quality values were available for setting maximum levels.

8.4 Procedure for Defining Human Health Bioaccumulation Levels. Bioaccumulation values for those chemicals that are a human health concern because of fish consumption were calculated by estimating daily consumption rates of fish that could have been exposed at the disposal site, calculating the target tissue concentration values, and comparing the target values to data on bioaccumulation for species from Puget Sound. These target values will be used to interpret laboratory bioaccumulation tests on proposed dredged material relative to human health concerns. The Puget Sound bioaccumulation data used in this study included laboratory and field data for species (mostly bivalves) from sediments that are representative of both reference and non-reference areas throughout Puget Sound.

8.4.1 Assumptions Made in Calculating Adjusted Health Indicators. Adjusted health indicators were developed by EPWG to approximate tissue concentrations of concern. The following simplifying assumptions were made concerning the relationship between tissue concentrations of chemicals of concern in aquatic species and potential human health concerns:

- Human exposure route is primarily through consumption of fish that could be directly exposed to bottom sediments at the disposal site (i.e., flatfish)

BEFORE THE POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

TULALIP TRIBES OF WASHINGTON, Appellants, v. STATE OF WASHINGTON Respondent.	PCHB 87-64 ORDER GRANTING MOTION TO DISMISS ISSUES CONCERNING TRIBAL TREATY RIGHTS

This matter came before the Board, Wick Dufford, Judith Bendor and Lawrence J. Faulk on the Motion of respondent, Department of Ecology (DOE).

The appellant Tulalip Tribes of Washington have appealed the actions of DOE in issuing a water quality certification, a temporary modification of water quality standards and a coastal zone program concurrence in connection with the United States Navy's proposal to construct a homeport for an Aircraft Carrier Battle Group at Everett, Washington. The Tribes' appeal in Section II.F. challenges DOE's actions on the assertion that they pose a threat to federally secured tribal treaty rights.

DOE filed a Motion to Partially Dismiss on May 19, 1987, asking for an Order dismissing the treaty right's issue on the basis that the claim was one upon which the Board could grant no relief or, alternatively, that the Board lacks subject matter jurisdiction over the issue. The Tribes' opposed the motion and all parties submitted memoranda in support of their positions.

The Board having considered the presentations of the parties Orally Announced its decision to grant the Motion prior to the commencement of hearings. This Order memorializes that decision, as follows:

I

The Navy has sought what are commonly called Section 10 and Section 404 permits from the United States Army, Corps of Engineers to construct its Everett homeport project. The state actions under appeal are a part of this federal permitting process.

The water quality certification and its accompanying water quality modification express the DOE's view that if the project is carried out, as proposed and conditioned, specified provisions of federal law will not be violated.

The Coastal Zone program concurrence is an action of a similar kind. It attests to the State's opinion that the Navy was correct when it certified to the Corps of Engineers that the homeport project complies with the State's federally approved Coastal Zone Management program.

II

The-so called water quality certification is required by Section 401 of the Federal Clean Water Act. (33 U.S.C. 1341). In pertinent part, Section 401 provides:

> (a)(1) Any applicants for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the state in which the discharge originates or will originate, . . . that any such discharge will comply with applicable provisions of Sections 301, 302, 303, 306, and 307 of the Act. . . .

Most of the sections specified for review relate to effluent limitations established federally. See Sections 301, 302, 306 and 307. But Section 303 deals with water quality standards adopted by the states. The primary focus of the state function in certification has generally been on the state water quality standards.

None of the sections specified for review in the certification process makes any reference to Indian treaty rights. There is no suggestion anywhere in the Federal Clean Water Act that compliance with such treaties was meant to be considered by states in issuing certifications under Section 401.

III

Subsection (d) to Section 401 grants the states the explicit power to add conditions to water quality certifications including, among other things, monitoring conditions which will assure compliance with

limitations imposed under the Federal Clean Water Act or with any special requirements of state law relating to water quality. See Arnold Irrigation District v. Department of Environmental Quality, 79 Or. App. BC, 717 P.2d 1274 (1986). The temporary modification of water quality standards involved here is an expression of this aspect of the certification process.

Subsection 401(d) however, adds nothing which makes rights secured under federal treaties relevant to the certification process.

IV

The coastal zone program concurrence is required by Section 307 of the Federal Coastal Zone Management Act. (16 U.S.C. 1456). In pertinent part, Section 307 provides:

> (3)(A) After final approval by the secretary of a state's management program, any applicant for a required federal license or permit to conduct an activity affecting land or water uses in the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity complies with the state's approved program and that such activity will be conducted in a manner consistent with the program. . . .
> At the earliest practicable time, the state or its designated agency shall notify the federal agency concerned that the state concurs with or objects to the applicants certification. . . .

The heart of the state's coastal zone management program is the Shoreline Management Act, chapter 90.58 RCW. The State Shorelines Hearings Board has previously refused to evaluate conformity with

tribal treaty rights in reviewing permits issued pursuant to the SMA. Tulalip Tribes et al. v. BCE Development et al., SHB 87-5&6 (July 23, 1987). The Shorelines Board has reiterated that approach in an Order relating to the shorelines appeal of the instant project.

V

The Pollution Control Hearings Board is wholly a creature of statute and thus the scope of our reviewing authority is statutorily established, See, Human Rights Commission v Cheney School District, 97 Wn. 2d 118, 641 p.2d 143 (1982). As relevant here, this Board has been granted jurisdiction to hear and decide appeals from decisions of the DOE concerning "the issuance, modification or termination of any permit, certificate or license." RCW 43.21B.110(c).

The reach of our reviewing authority is governed by the substantive requirements of the acts under which permits, certificates or licenses are issued. No further power is expressed nor implied in our jurisdictional grant. Here, federal treaty consistency is, we conclude, beyond the scope of the laws which create the requirement for the DOE decisions at issue. Therefore, we lack subject matter jurisdiction over treaty rights issues.

VI

Accordingly the Motion, must be granted. But in granting the Motion we do not intend to imply that the rights of the Tulalip Tribes secured by federal treaty need not be respected by the State nor that

the State may permit activities to go forward in violation of those rights.

The treaty of the United States with the Tulalip Tribes, like other treaties, is the law of the land. The Supremacy Clause of the United States Constitution makes it paramount over conflicting state laws. Its terms are to be given effect under federal law, unless clearly abrogated by the Congress.

However, the source from which the duty to comply with the treaty comes, arises from terms of the treaty itself, as protected by the Constitution, not from the specific statutory provisions we are charged with reviewing. Though our reviewing role is circumscribed, all parties are aware that there are other available forums for obtaining review of asserted state interference with federally secured tribal treaty rights.

ORDER

The DOE's Motion to Partially Dismiss is granted. The issue of consistency of the actions at issue with federally secured treaty rights is dismissed.

DONE this 26th day of May 1988.

POLLUTION CONTROL HEARINGS BOARD

WICK DUFFORD, Chairman

LAWRENCE J. FAULK, Member 5/25/88

(See Separate Opinion)
JUDITH A. BENDOR, Member

Judith A. Bendor, Separate Cuncurring Opinion:

I concur with the result that the Pollution Control Hearings Board does not have jurisdiction to adjudicate Indian Tribal Treaty rights, but take this opportunity to elaborate since my colleagues' opinion is somewhat sparse.

I

This motion to dismiss is in PCHB appeal No. 87-64, which is consolidated with appeals PCHB No. 87-63 and Shoreline Hearings Board appeals Nos. 87-31 and 87-33, the Everett Navy Homeport dredge disposal proposal. In the Shoreline appeals, the six-person Board unanimously held that it lacked jurisdiction to adjudicate Indian treaty rights. But in so doing, the Board carefully stated the limits of its ruling:

> This ruling should not be interpreted to mean that local and state government need not consider Indian fishing rights in determining whether to grant, condition or deny a substantial development or conditional use permit. Where competing use determinations involving Indian fishing must be made or where environmental impacts on Indian fishing and the fisheries resource must be evaluated under SEPA, there must necessarily be consideration on Indian fishing rights. We do not hold that Indian fishing rights are not appropriately considered in the permitting process; we hold that the extent of such rights is not properly adjudicated in this forum.
>
> In addition, we reiterate the statement made in Tulalip Tribes, et al. v. BCE Development, et al., SHB 87-5&6 (July 23, 1987), where we said that, where appropriate, the parties "may seek to introduce evidence, for example, on the Tribes' usual and accustomed fishing

grounds, their areas of navigation, and so forth . . . " to assist the Board in determining conformance with the Shoreline Management Act, SEPA or the local master program. Tulalip Tribes v. City of Everett and Washington Department of Ecology, SHB No. 87-33 (January 28, 1988; Order Dismissing Indian Treaty Rights).

II

It is clear that Indian tribes remain in a unique legal position in relation to the federal and to state governments, retaining certain sovereign powers. The federal Clean Water Act ("CWA"), 33 U.S.C. 1251 et seq., prior to 1987 did not explicitly deal with Indian treaty rights, except to make the special status of such rights abundantly clear:

> 33 U.S.C. Section 1371: Authority under other laws and regulations
> (a) Impairment of authority or functions of officials and agencies; treaty provisions
> This chapter shall not be construed as [. . .] (3) affecting or impairing the provisions of any treaty of the United States. (Emphasis added)

The 1987 Federal Clean Water Act amendments, at 33 U.S.C. Section 1377, enacted February 4, 1987, has subsequently provided specific mechanisms for Indian tribes to participate as States within the federal CWA framework, see Appendix A herein. That amendment again makes clear Indian tribes special status. But since it has neither been argued nor is there any evidence that the appellant Tulalip Tribes endeavored to be treated under the specific provisions of 33 U.S.C. Section 1377, that issue need not be further addressed in the context of this Motion to Dismiss.

III

The State's Clean Water Act, Chpt. 90.48 RCW, calls for the maintenance of the highest possible standards to insure the purity of all waters of the state consistent with public enjoyment, the propagation and protection of wildlife, birds, game, fish and other aquatic life, and to that end requires the use of all known available and reasonable controls to prevent and control pollution of all waters of the state. RCW 90.48.010. The state has an affirmative duty to prevent pollution, i.e., to prevent the contamination or alteration of waters such that the waters are not rendered harmful, detrimental or injurious to public welfare or other legitimate beneficial uses. RCW 90.48.010-.020.

The State water quality criteria are adopted pursuant to both the federal CWA and the State CWA, and are designed to protect beneficial uses. Under State law, Indian tribes' fishing uses at a minimum are afforded no less protection than are other fishing uses, e.g., recreational and commercial uses. The Board, in the exercise of its lawful authority, upon appeal can determine if such overall fishing uses are being protected or if there are significant adverse environmental effects. See companion opinion, Friends of the Earth, et al. v. DOE, PCHB Nos. 87-63 and 87-64, FINAL ORDER.

It is statutory public policy for the State of Washington to cooperatively attempt to extinguish sources of water quality

degradation. RCW 90.48.010. In so doing, cooperatively protecting Indian fishing uses is a part of the State's own pollution law. See, RCW 90.48.010. Moreover, such cooperation furthers overall federal-state cooperation, a central theme in the water quality certification process, and federal and state pollution laws in general.

Thus, while the PCHB correctly concludes in this instance it cannot adjudicate Indian treaty rights, there remains ample latitude for all residents of Washington, including the Tribes, to have the protection of the waters, the aquatic environment and the beneficial uses fully considered by the Board.

IV

The coastal zone concurrence function is also a requirement of federal law. 16 U.S.C. Section 1456; Section 307 of the Coastal Zone Management Act. That section reads, in pertinent part:

> (3)(A) After final approval by the secretary of a state's management program [. . .] any applicant for a required federal license or permit to conduct an activity affecting land or water uses in the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity complies with the state's approved program and that such activity will be conducted in a manner consistent with the program. [. . .] At the earliest practicable time, the state or its designated agency shall notify the federal agency concerned that the state concurs with or objects to the applicant's certification. [. . .]

Standards are incorporated into the federally-approved state coastal zone program. Thus, the same conclusions about the breadth of the Board's review in terms of protecting uses, considering environmental

effects, and allowing introduction of relevant evidence, applies equally in the coastal zone concurrence appeal process. Such subject matter breadth is in harmony with the broad mandates of the Coastal Zone Management Act. See, Eichenberg and Archer, The Federal Consistency Doctrine: Coastal Zone Management and "New Federalism", 14 Ecol. Law Quarterly 1, 27 (1987).

DONE this 25th day of May, 1988.

Judith A. Bendor

JUDITH A. BENDOR, Member

APPENDIX A

33 U.S.C. 1377
(e) Treatment as states. The Administrator is authorized to treat an Indian tribe as a State for purposes of title II and sections 104, 106, 303, 305, 308, 309, 314, 319, 401, 402, and 404 of this Act [33 U.S.C. Sections 1281 et seq., 1254, 1256, 1313, 1315, 1318, 1319, 1324, 1329, 1341, 1342, 1344] to the degree necessary to carry out the objectives of this section, but only if

(1) the Indian tribe has a governing body carrying out substantial governmental duties and powers;
(2) the functions to be exercised by the Indian tribes pertain to the management and protection of water resources which are held by the United States in trust for Indians, held by a member of an Indian tribe if such property interest is subject to a trust restriction on alienation, or otherwise within the borders of an Indian reservation; and
(3) the Indian tribe is reasonably expected to be capable, in the Administrator's judgment, of carrying out the functions to be exercised in a manner consistent with the terms and purposes of this Act and of all applicable regulations.

[. . .]

Not later than 18 months after the date of the enactment of this section, [enacted February 4, 1987], the Administrator shall, in consultation with Indian tribes, promulgate final regulations which specify how Indian tribes shall be treated as States for purposes of this Act. The Administrator shall, in promulgating such regulations, consult affected States sharing common water bodies and provide a mechanism for the resolution of any unreasonable consequences that may arise as a result of differing water quality standards that may be set by States and Indian tribes located on common bodies of water. Such mechanism shall provide for explicity consideration of relevant factors including, but not limited to, the effects of differing water quality permit requirements on upstream and downstream dischargers, economic impacts, and present and historical uses and quality of the waters subject to such standards. Such mechanism should provide for the avoidance of such unreasonable consequences in a manner consistent with the objective of this Act.